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Heating Piping & Air Conditioning

INDUSTRIAL • COMMERCIAL • INSTITUTIONAL • PUBLIC BUILDINGS

Journal Section of the American Society of Heating and Air-Conditioning Engineers—p. 181

January 1956

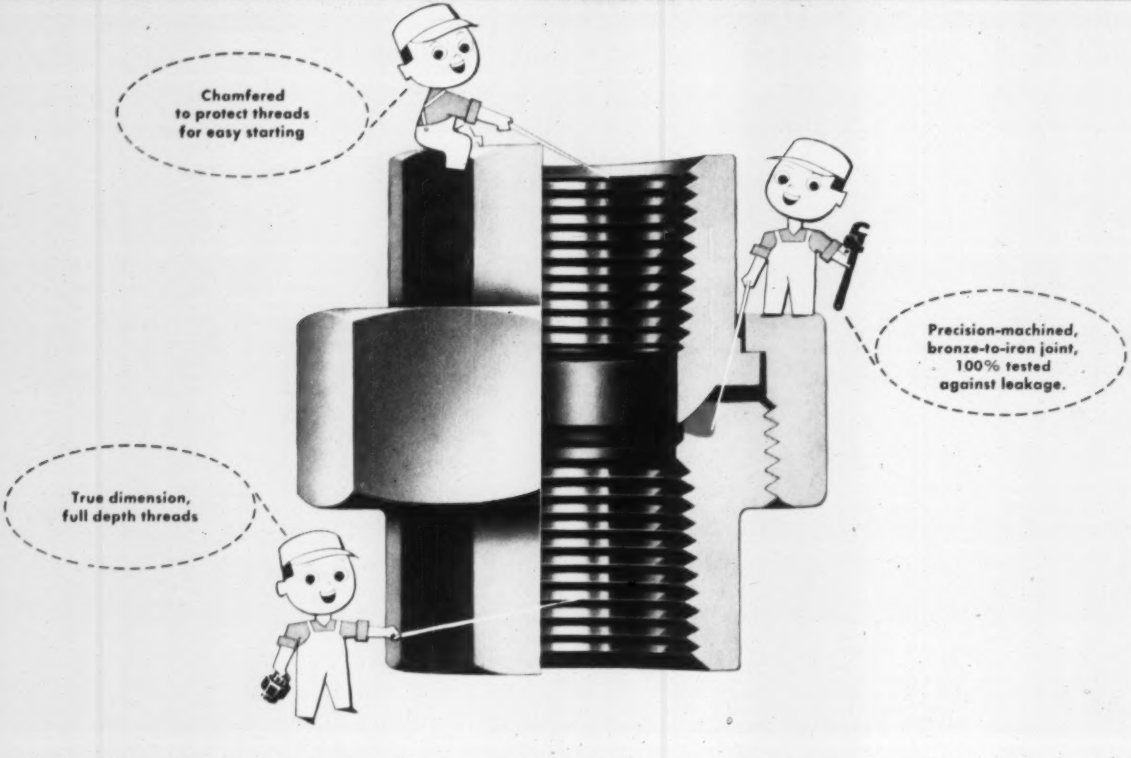
DIRECTORY NUMBER

See the yellow pages for up-to-date product information—compiled by HPAC's staff

Save time on the job . . . avoid customer gripes after the job, with

GRINNELL bronze-to-iron UNIONS

150 lb.
250 lb.
300 lb.
300 lb. AAR


Chamfered to protect threads for easy starting
Precision-machined, bronze-to-iron joint, 100% tested against leakage.
True dimension, full depth threads

In the Grinnell Union, there's strength . . . *rugged, built-in strength!* A superior grade of malleable iron is used in Grinnell bronze-to-iron unions — followed by careful manufacture and frequent quality checks. The end result is the high quality Grinnell Union which must pass the final air pressure inspection test under liquid before it is accepted. No wonder Grinnell bronze-to-iron unions are a standard of comparison for the industry.

Quality Grinnell bronze-to-iron unions feature:

- Precision-machined, bronze-to-iron joints for a positive, leak-proof connection
- 100% tested with air under liquid
- Bronze ring inserts of improved design
- True dimension, full depth threads
- Chamfered to protect threads for easy starting

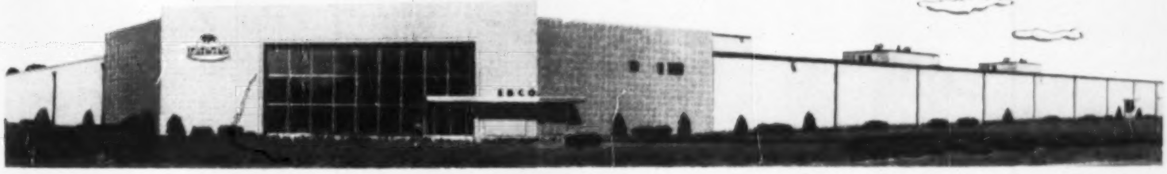
GRINNELL

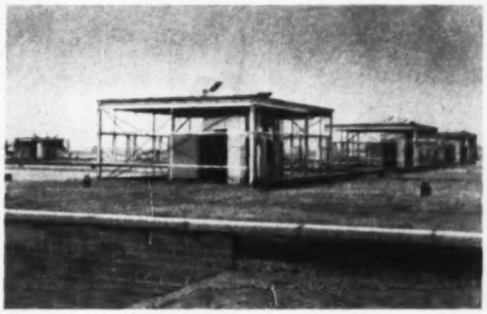
WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

Manufacturer of: pipe fittings • welding fittings • forged steel flanges • steel nipples • engineered pipe hangers and supports
Thermolier unit heaters • Grinnell-Saunders diaphragm valves • prefabricated piping • Grinnell automatic fire protection systems

usAIRco self-contained RK units cool new $3,000,000 windowless "dream" plant





Each penthouse contains an individually operating 100-ton (two 50 h.p. RK) system serving a separate area of the building. Units containing built-in water-saving evaporative condensers are factory-assembled and tested. Each unit was elevated to the roof in one piece. Photo taken during installation.

Supply ducts deliver conditioned air over a radius of 75 feet. Twenty-two feet high ceilings permit high velocity without creation of drafts at the working level.

240,000 sq. ft. Ebco Manufacturing Company conditioned by twelve 50 h.p. Central Station Units, located in six roof penthouses

A new application of comfort conditioning is found in the Columbus, Ohio home of Ebco, world's largest producer of office type water coolers. The all-year system includes 12 USAIRco RK-50's, six gas fired heaters which use the RK blowers for circulation. Both cooling and heating are available at all times because change-over is automatic.

This system was selected after a study revealed central chilled-water and built-up installations were too costly. The advantages of the self-contained station were many. (1) Zone control is automatically provided. (2) Breakdown of equipment would not affect entire plant. (3) Expansion of plant would only require the addition of units . . . no revision of present installation. (4) No licensed fireman or engineer is required. (5) Automatic refrigerant pump-down is built into RK units. (6) Night watchman can make any adjustments required during non-working hours. (7) All controls in one central panel.

Forty-eight additional tons are used to condition the offices, lobby, and conference rooms.

F & Y Building Service, Inc., were the contractors and provided the design through architect Merle Robert Maffit, A.I.A.

for descriptive literature on RK's write: C. C. Hawkinson

UNITED STATES AIR CONDITIONING CORPORATION

MINNEAPOLIS 14, MINNESOTA • *Export: 13 E. 40th St., N. Y. 16, N. Y., U.S.A.*

usAIRco
50 YEARS OF AIR CONDITIONING

Architect
Louis C. Hinckley

General Contractor
E. J. Pinney Co.

Air Conditioning Contractor
Simons Burner & Petroleum Co.

240 POINTS of CONTROL

ON BUSH AIR CONDITIONING INSTALLATION

That's how the contractor describes the BUSH air conditioning system at the new Medical Center, Springfield, Mass.

Entire building is conditioned with BUSH units. 'CR' Remote Air Conditioning Units . . . 240 of them . . . provide year 'round comfort: heating in winter, cooling in summer and between-season circulation of filtered air. Units are individually adjustable to suit room occupant's preference or a particular area's requirements. Shallow depth enhances room appearance, saves valuable floor space.

Interior zone conditioning of waiting rooms, corridors, etc. is accomplished by 4 Bush Air Handling Units . . . 2 of the vertical floor-mounted type and 2 horizontal ceiling-hung models. These versatile units are available in a wide range of capacities and with extra-efficiency Inner-Fin coils — exclusive with BUSH.

BUSH

Write for descriptive literature on these and other Bush Air Conditioning and Refrigeration units . . . most complete line in the industry.

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RIVERSIDE · CALIFORNIA

Heating Piping & Air Conditioning Vol. 28 No. 1

(with which is merged the Aerologist)

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gives you all these features for Low Pressure Heating Service!

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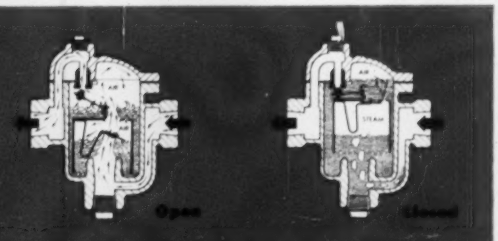
Use of a "blast" bucket with auxiliary thermic vent gives maximum air-handling capacity. Air and water blow straight through until steam closes vent.



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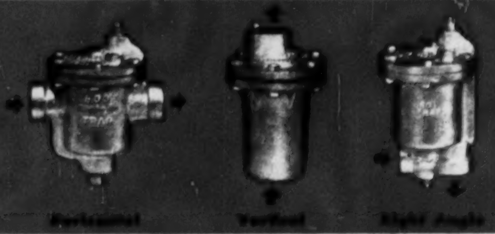
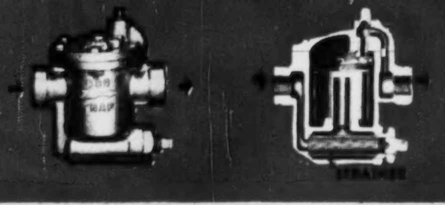
Any pipe connection—horizontal, vertical or angle—available for the majority of installations to save time, labor and fittings.



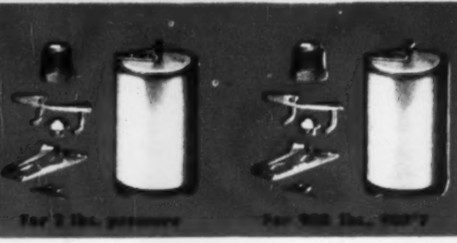
3. INTEGRAL STRAINER

The four most commonly used trap sizes are available with strainers built-in to the body to save time, labor and money through faster installation with fewer fittings.



4. STAINLESS MECHANISM

Valve and seat of hardened chrome steel, all other parts 18-8 *stainless—identical* to materials and workmanship used in traps for 900 lbs., 900°F.



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Traps and Parts in Stock in Over 100 Cities. Call your nearby Armstrong Representative or Jobber Today.

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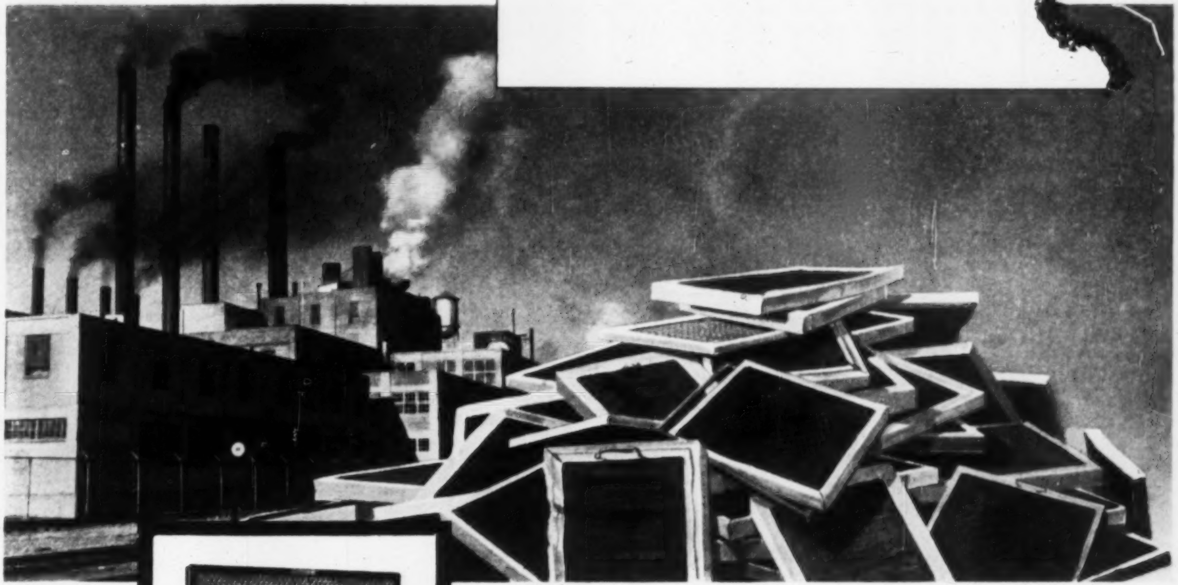
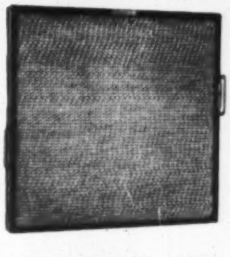
SEQUEL
TO

"...or equal"





Standard 2" FAR-AIR Panel Filter.

Send for your copy showing complete specifications on the FAR-AIR line of quality filters.

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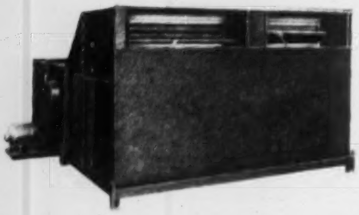
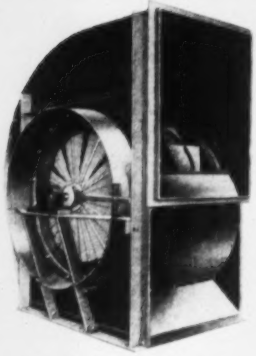
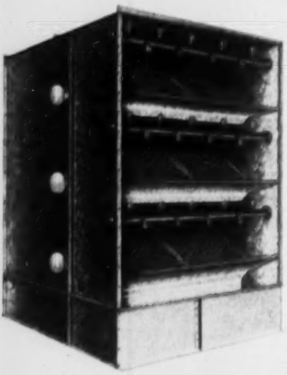
You can rely on Clarage . . .



CLARAGE
Air Conditioning Units

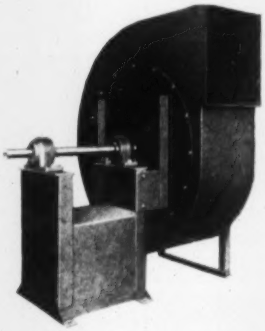
Blow-Thru Multitherms (shown) for zone control. Draw-Thru Multitherms for comfort and process applications. Capillary Conditioners for exceptional air cleaning.

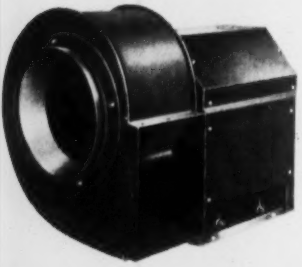




CLARAGE
Air Washers and Sprayed Coil Units

Capillary (shown) and Spray Type Air Washers for air cleaning and purification. Unicoil Units — sprayed coil equipment — for central station systems.





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Complete, ready-to-run units for smaller air handling requirements. Direct connected and V-belt models in 18 sizes, capacities 100 to 14,000 cfm.

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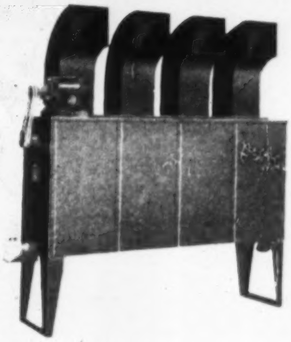
Sales Engineering Offices in All Principal Cities

. . . Air Handling and Conditioning Equipment

CLARAGE
Ventilating and Air Conditioning Fans

Type NH Fans (shown) with backwardly inclined blade wheels, capacities 1,000 to 725,000 cfm. Type HV Fans with forward curved multiblade wheels, capacities 150 to 450,000 cfm.

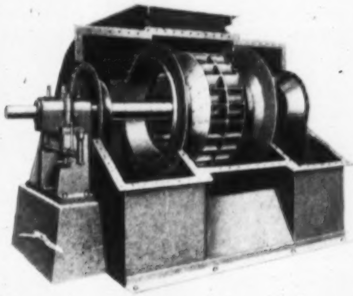


CLARAGE
Unit Heaters

Unitherms (shown) equipped with multiblade fans, capacities 60,000 to 1,160,000 B.t.u. Clarco Heaters equipped with propeller fans, capacities 28,000 to 270,000 B.t.u.

CLARAGE
Industrial Air and Material Handling Fans

Type XL Fans range up to 130,000 cfm, 18" SP, 60" inlet diameters. Four wheel types, 16 fan sizes—smaller sizes adjustable as to discharge.

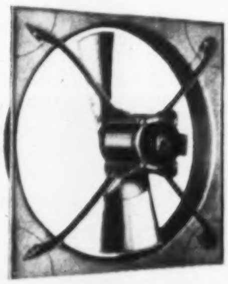


CLARAGE
Mechanical Draft Equipment

Type RT Fans (shown) and other types of Clarage Fans are designed and constructed for induced draft, forced draft, and high pressure industrial applications.

CLARAGE
Industrial Exhausters and Blowers

Type CI Exhausters (shown) with capacities 200 to 3,800 cfm, pressures to 22". Type O Blowers with capacities 150 to 45,000 cfm at high pressures.



CLARAGE
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Propeller Fans with capacities 700 to 36,000 cfm . . . Unit Stoker Fans in a wide size range . . . Vortex Control for efficient, economical air volume regulation.

. . KALAMAZOO, MICHIGAN
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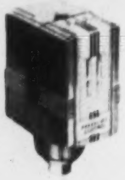
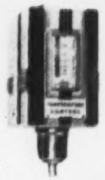
For pressure, level and temperature limit control—on gas, air, water, steam—for domestic, commercial, or industrial processes—you need now look to one source and one source only. In General Controls' line you will find a full selection, a free comparison of the finest quality in all types of designs—to guarantee that your control selection is perfect for your specific application.

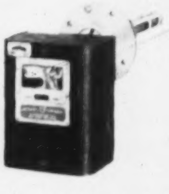


700 Series Pressure Control—For air, liquids, non-combustible gases. Easy settings, fingertip adjustments. Direct or reverse action in various pressure ranges.

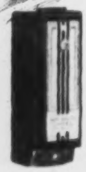


990 Series Remote Bulb Control—Favored for tobacco curing barns and the like. Extremely sensitive throughout range. Quick external temperature settings. Protected switch mechanism.

L-38 Series Low Pressure Control—Spring-loaded diaphragm with mercury switch. Adjustable range. For combustion, air or gas pressure check, or safety gas check.



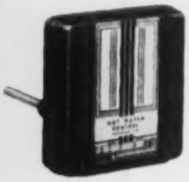
L-34 Series Fan and Limit Control—Mercury switch helix type for any warm air furnace. Switch fingers for visible setting . . . positive leveling tube.



500 Series Strap-On Temperature Control For operating or limit control on line, or low voltage circuit. Rapid response from conductor temperature. Mounts in any position.

404 Series Air Limit Control—Twin contact switch actuated by protected bimetal helix. Fingertip adjustments. Operates in any position.

480 Series Fail-Safe Fan and Limit Control Combination liquid charge, thermal element type. Factory set limit prevents excessive temperature damage. Fingertip settings. Operates in any position.



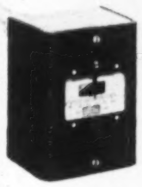
600 Series Immersion Temperature Control For close differentials and extremely rapid response. External temperature setting, internal differential adjustment.

454 Series Fan Control—Separate fingertip settings for cut-in and cutout. Switch actuated by quick-acting bimetal helix. Summer fan switch.

474 Series Combination Fan and Limit Control—Helix, bimetal type. Separate fingertip fan and limit settings. External summer fan switch. Any position.

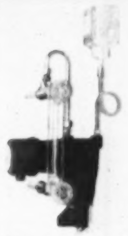
PLUS . . . PERFEX

of limit controls in the industry

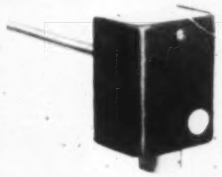


L-32 Series Immersion Thermostat — Mercury switch model. Visible temperature settings. Built-in check level. External adjusting screw. For boilers, tanks, vats, and pipe systems.

650 Series Bimetal Immersion Thermostat Thermal element enclosed within removable wall. Leveling not required. For use as operating or limit control.



L-26 Series Low Water Cutoff — Water level control and low water cutoff (glass gauge type). Maximum operating pressure 20 psi. Float type — continuous duty.



L-46 Series Expansion Rod Control — Heavy duty limit control. Snap action, bimetal type. Hi-speed response for industrial-commercial applications.

L-44 Series Fan, Limit or Combination Control — "Klikswitch" type control with choice of "S" shaped bimetal elements in short insertion lengths to 3". Snap action, sealed switch.

L-27 Series Low Water Cutoffs — Electrode type. Mounts in pressure line, glass gauge, or direct in boiler, tank, etc. No moving parts in liquid or steam.

General Controls'

Pressure, Level

and

Temperature

Limit Controls

The combination of two leading names in the heating control industry — General Controls and Perfex — offers you a truly complete line for the first time. Here is a line composed of time-tested and field proved products — a line backed by the finest field service available today . . . near as your phone.

5 plants geared to produce top quality controls in high volume to satisfy your schedules.

7 regional warehouses strategically located to meet your emergency control needs with immediate delivery.

40 branch offices placing top caliber sales and service counsel near as your phone at all times.

Naturally, you'll want full details immediately as to how this complete limit control line fits into your plans

Write today for Catalog 56II

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MANUFACTURERS OF AUTOMATIC CONTROLS FOR HOME, INDUSTRY AND THE MILITARY

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the BEVERLY HILTON

Luxurious new hotel shows how you can

Satisfy any client's most exacting indoor weather needs

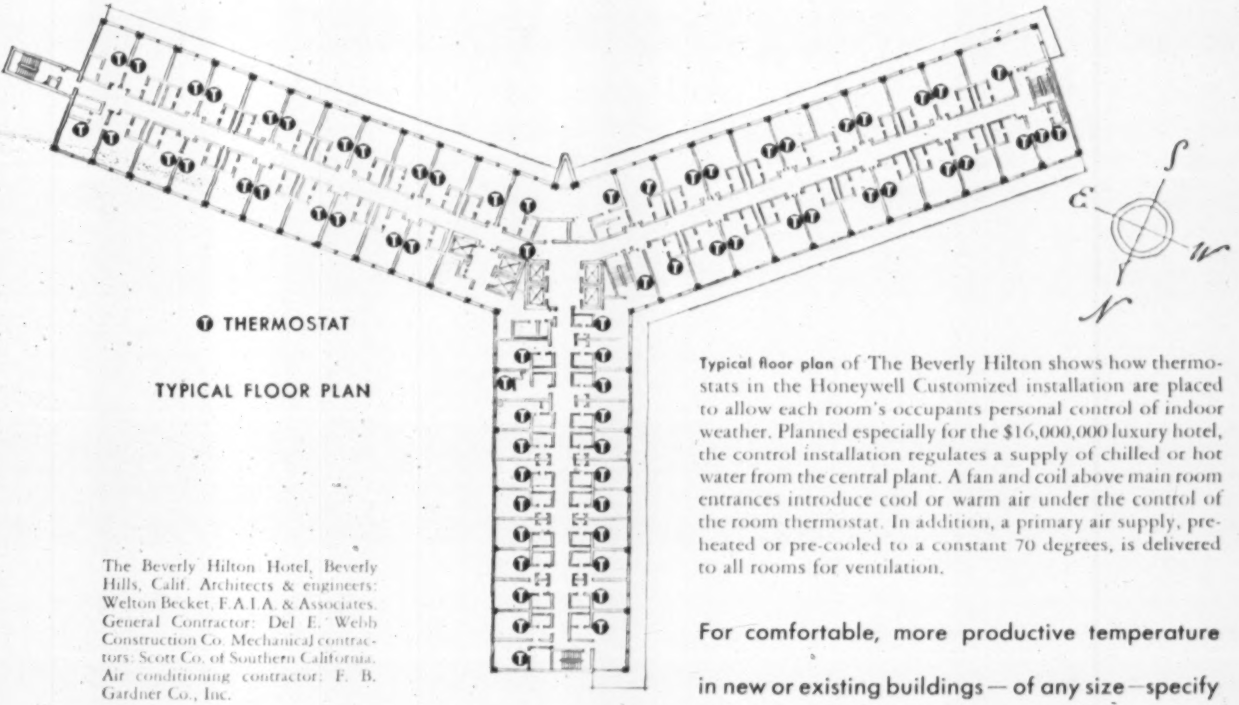
Honeywell Customized Temperature Control gives Beverly Hilton guests the climate of their choice in each of 450 rooms

FOR THE MOST modern kind of hotel, newest in Conrad Hilton's world-wide group, The Beverly Hilton's planners chose the most advanced type of temperature control installation: Honeywell Customized.

"Customized" is the key word here. It means that a Honeywell Customized Temperature Control installation is designed to fit the needs of the building and its occupants—in heating and cooling, in ventilating and humidity control.

In The Beverly Hilton, a completely air-conditioned luxury hotel, guests are assured comfort suited to their individual requirements; each simply dials his own choice of indoor weather.

Only Honeywell can provide true "customized" control. Because only Honeywell manufactures all three types of controls—pneumatic, electric and electronic.



T THERMOSTAT

TYPICAL FLOOR PLAN

The Beverly Hilton Hotel, Beverly Hills, Calif. Architects & engineers: Welton Becket, F.A.I.A. & Associates. General Contractor: Del E. Webb Construction Co. Mechanical contractors: Scott Co. of Southern California. Air conditioning contractor: F. B. Gardner Co., Inc.

Typical floor plan of The Beverly Hilton shows how thermostats in the Honeywell Customized installation are placed to allow each room's occupants personal control of indoor weather. Planned especially for the $16,000,000 luxury hotel, the control installation regulates a supply of chilled or hot water from the central plant. A fan and coil above main room entrances introduce cool or warm air under the control of the room thermostat. In addition, a primary air supply, preheated or pre-cooled to a constant 70 degrees, is delivered to all rooms for ventilation.

For comfortable, more productive temperature in new or existing buildings — of any size — specify Honeywell Customized Temperature Control

Whatever the building, Honeywell Customized Temperature Control can help solve your clients' problems of heating, ventilating, air conditioning and industrial control. At the same time you can give them more comfort, more efficiency, more economy.

For full details on Honeywell Customized Temperature Control, and economical Maintenance Plan, call your local Honeywell office. Or write Honeywell, Dept. HA-1-157, Minneapolis 8, Minnesota.

Conrad N. Hilton, president, Hilton Hotels Corporation, says: "Among the features that make our new hotel completely modern is a Honeywell Customized Temperature Control installation that allows each guest to select his own comfort preference. This is in keeping with the Hilton tradition of providing our guests with every comfort facility."

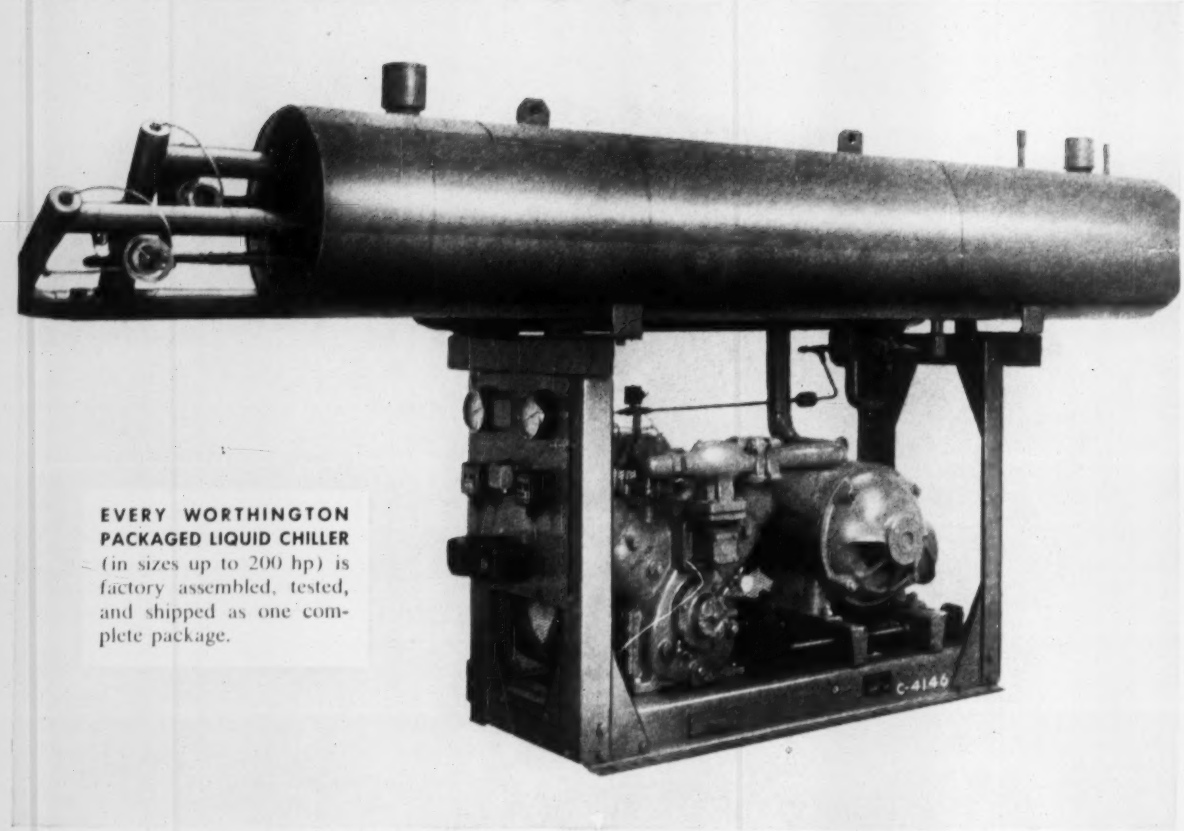
Luxurious appointments are exemplified by this sitting room of a typical Beverly Hilton suite. Modern *comfort* is provided by the Honeywell Customized Temperature Control installation, which includes a conveniently located thermostat in every room. Once the guest dials the temperature he likes, the thermostat keeps the comfort level constant—despite heat gained or lost through floor-to-ceiling windows.

MINNEAPOLIS

Honeywell

Customized Temperature Control

H HONEYWELL *112 offices across the nation*



EVERY WORTHINGTON PACKAGED LIQUID CHILLER (in sizes up to 200 hp) is factory assembled, tested, and shipped as one complete package.

Low-cost operation, easy installation . . .

you get both with Worthington's new packaged liquid chiller

If you're interested in process cooling, refrigeration, or air conditioning, take a long look at these six big advantages of the new Worthington packaged liquid chillers:

LOW-COST OPERATION — Simple variable capacity control exactly matches load requirements — results in unusually economical operation.

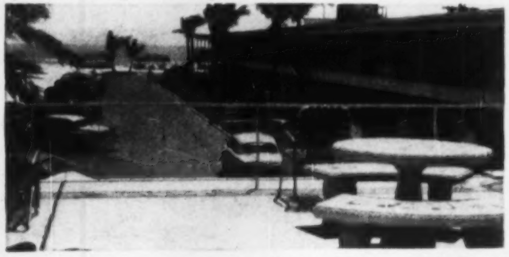
EASY INSTALLATION — All units are shipped completely assembled. Only simple foundations are needed.

FACTORY ENGINEERING — You benefit from Worthington's undivided responsibility. The entire unit—compressor, chiller, drive and controls—comes in one Worthington-supplied package.

MINIMUM FLOOR SPACE — Efficient, compact design means greatly reduced space requirements.

LONG LIFE — over a million dollars worth of research went into Worthington's Freon compressor — all aimed at making it the most durable unit ever.

WIDE SELECTION — No matter what you want to chill — water or brine — you can get a Worthington packaged liquid chiller that's exactly right for the job. Sizes from 7½ all the way up to 200 hp. Worthington Corporation, Harrison, N.J.



Top performance from a Worthington Packaged Chiller in their first building convinced the management of Azure Tides Motel. They're putting a second Packaged Chiller in their new addition.

Architect: Frank C. Martin, Sarasota, Fla.; *General Contractor:* Charles Ongheri, Sarasota, Fla.; *Mechanical Contractor:* J. H. Cobb, Sarasota, Fla.

WORTHINGTON

Climate Engineers to Industry, Business and the Home

THE MARK OF QUALITY

BARBER
COLMAN

UNI-FLO
ENGINEERED AIR
DISTRIBUTION
ELECTRIC-ELECTRONIC
Automatic
Controls

Why be "caught in the middle" on indoor comfort problems?

No architect, engineer, nor contractor needs to worry these days about divided responsibilities of manufacturers supplying air distribution and automatic control equipment. In your nearby Barber-Colman Field Office are engineers with "know-how" about BOTH air distribution and automatic control. From ONE source you can get experienced counsel on installations for the finest possible results. Get answers to questions like these:

Comfort control?

Rapid air change?

Zone control?

Constant humidity control?

Critical comfort conditions?

Space-saving high velocity?

Better air distribution?

Constant temperature control?

Modern electric controls have come fast these last few years. Today, you can employ electricity to solve any temperature or humidity control problem . . . using available power lines for flexible, reliable, economical control systems. Join the trend to *"better control . . . electrically!"*

Uni-Flo engineered air distribution has no peer in reliability of performance data nor in fine quality of equipment. Most recent developments in air distributing devices have come from Barber-Colman's renowned laboratory. Stop "guesstimating"—specify Barber-Colman *and be sure!*

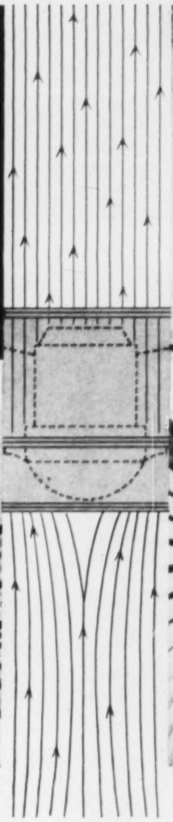
Come to ONE source . . .
come to . . .

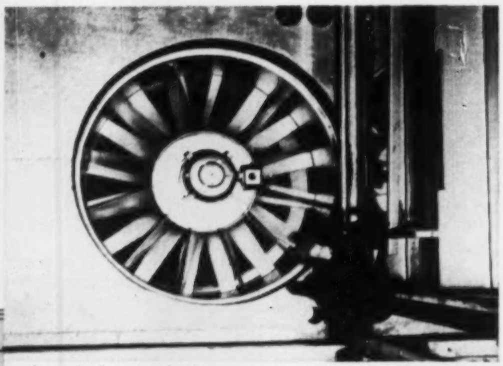
Barber-Colman Company

DEPT. A, 1601 ROCK ST., ROCKFORD, ILLINOIS, U. S. A.

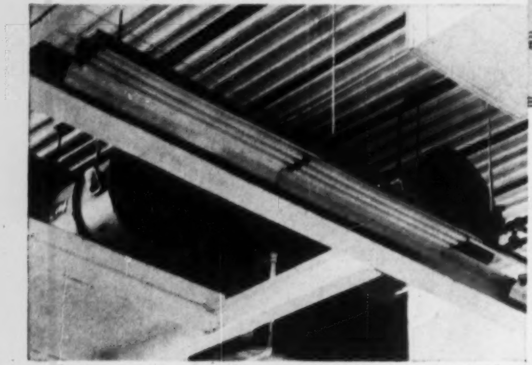
Ventilation Problems: Gone with the Joy Axivane Wind

Compact Joy installation at Boqueron, Venezuela, moves huge quantities of air.

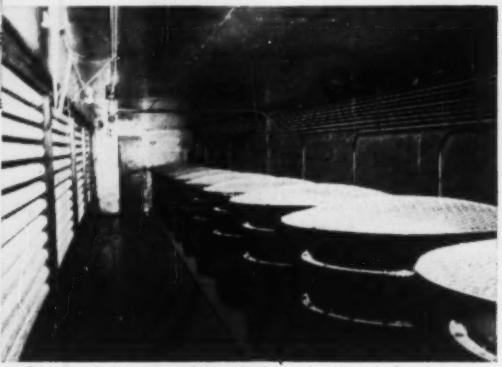




Joy Axivane design means power savings at Alcoa's Texas Plant.



Space-saving Joy fans are installed as part of the duct system at Reliance Electric's Ohio Plant.



Dependable Joy installation circulates freezing air in California Cold Storage Plant.

'Round the World, JOY Handles the Hard Ventilating Jobs

Joy handles the hard jobs in ventilation round the world because a Joy fan develops greater volume of air per pound of fan and motor—because of simplicity of installation that eliminates duct offsets, elbows, drives and guards. The JOY Axivane fan is a favorite of ventilating engineers because JOY installations save up to 70% of the space occupied by other fans of equivalent performance. This space-saving feature of Joy fans makes possible more profit-making production area.

An Axivane fan is an integral part of the duct in which it is installed. Pre-lubricated, double-shielded ball bearings permit the fan to be installed in any position—give you long service without attention. These precision air-moving machines are marvels of efficiency and compactness. They provide economical, efficient air circulation for all types of commercial and industrial applications.

You can choose from a standard line of over 136 models specially designed to meet the needs of modern industry. The Joy Axivane Series 1000 is a standard line available to you ready for installation.

For complete information about the JOY standard line of 136 models—to learn about JOY custom engineering service, write to **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario*

Write for FREE Bulletin 17-41

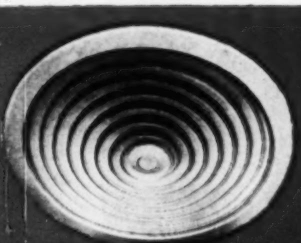
JOY

WORLD'S LARGEST MANUFACTURER OF VANEAXIAL-TYPE FANS

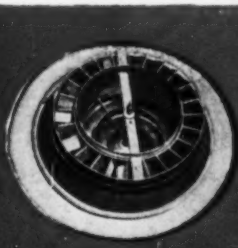
Consult a Joy Engineer

W&D 15840-17

TYPE R Circular, adjustable volume, constant pattern and radius of diffusion.

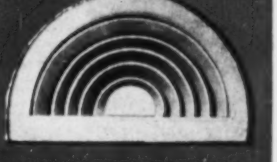


TYPE V Circular, adjustable volume and pattern, for heating and cooling.



TYPE CH Circular, adjustable supply and return, for heating and cooling.

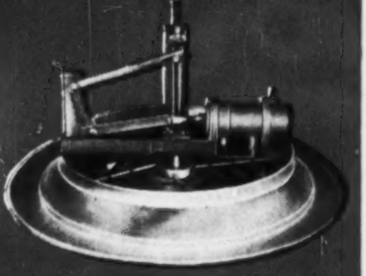
a model for every diffuser need FLEXIFLO



TYPE S Half-round, for side wall or ceiling, for heating or cooling.

- CIRCULAR
- SQUARE
- RECTANGULAR
- ADJUSTABLE
- AUTOMATIC

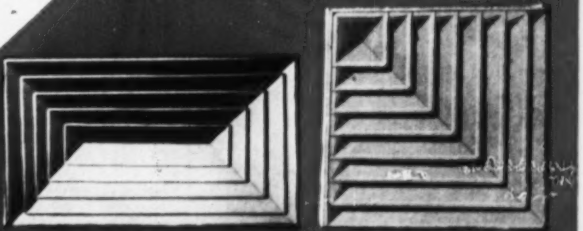
All FLEXIFLO diffusers are styled simply, beautifully . . . finished in baked enamel of any desired color . . . extra features include built-in equalizing deflectors . . . simple, easy installation and removal of diffuser cores with just a "twist of the wrist."



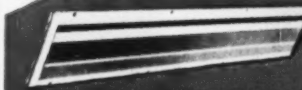
TYPE A Circular, adjustable volume, constant pattern AUTOMATICALLY CONTROLLED.

A COMPLETE LINE OF DIFFUSER ACCESSORIES

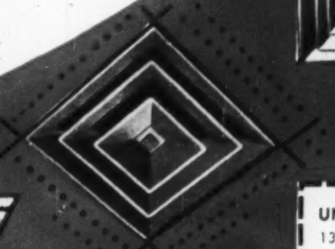
Let a trained FLEXIFLO sales engineer help you solve your air distribution problem. Representatives in major cities throughout the U.S. and Canada.



TYPE MP Rectangular, for one, two, three or four-way diffusion, 16 styles, hundreds of sizes to accommodate any shaped area.



TYPE MPL Long strips of any length, for one- or two-way diffusion.



TYPE H Square, adjustable volume, constant pattern and radius of diffusion.

FLEXIFLO

UNIVERSAL DIFFUSER CORP.
1360 GARRISON AVE., NEW YORK 59, N.Y.

UNIVERSAL DIFFUSER CORPORATION
1360 Garrison Avenue, New York 59

Please send me a complete catalog on

☐ Circular Diffusers ☐ Square & Rectangular Diffusers

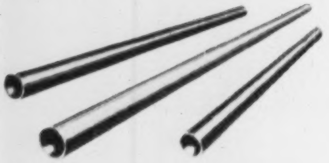
NAME____________________

COMPANY____________________

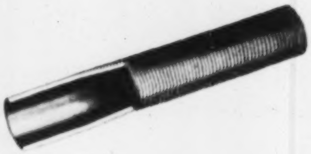
STREET____________________

CITY____________________STATE__________

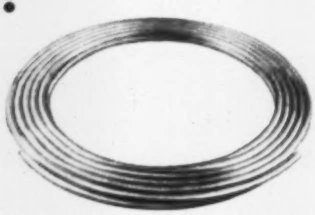
Here's What We Do!



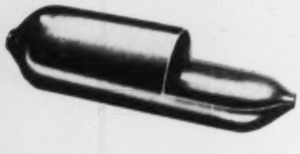
Wolverine manufactures plain tube in copper and aluminum in a wide range of sizes and alloys. Aluminum tube can be provided as drawn or extruded.



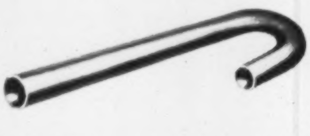
Wolverine Trufin* the integral finned tube will save space, step up efficiency in heat exchange operations.



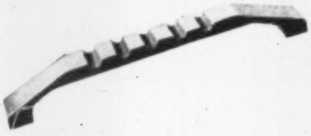
Wolverine plain tube can be furnished in easy-to-handle coils or exact straight lengths.



Wolverine through its exclusive Spun End Process** manufactures dependable, one-piece tubular-shaped parts, spun completely or partially closed to your specifications.

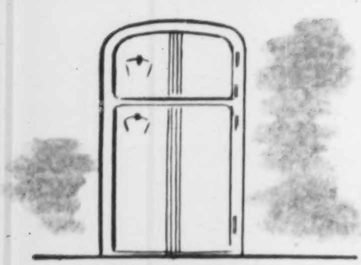


Wolverine can bend, spin, flare, bead, expand, reduce or otherwise fabricate tubing to your requirements.

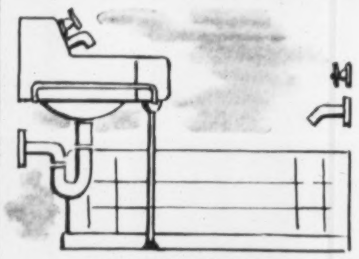


Wolverine also specializes in the manufacture of extruded aluminum shapes.

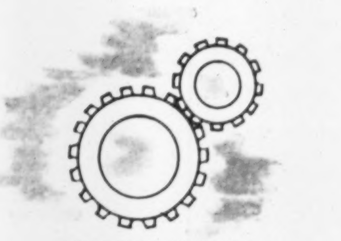
What Do You Do?



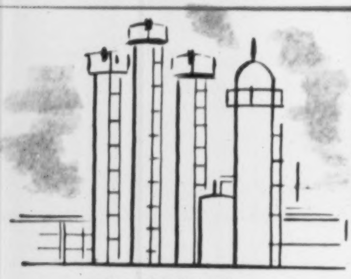
REFRIGERATION



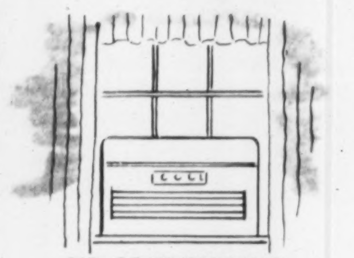
CONSTRUCTION



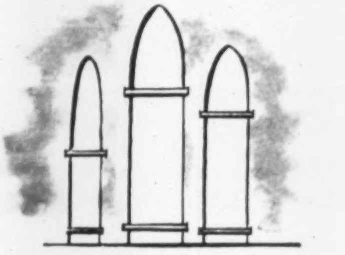
MANUFACTURING



PROCESSING



AIR CONDITIONING



ORDNANCE

Why Don't We Get Together?

If you are using tube, tubular-shaped products, or extruded aluminum shapes, it's sure as shooting that Wolverine can help save you time and money. You can get quick help from Wolverine's Field Engineering Service—a group of tube technicians who have the answers. Write for Wolverine's General Products Catalog—*right now!*
WOLVERINE TUBE, 1461 Central Avenue, Detroit 9, Michigan.

Wolverine Trufin is available in Canada through the Unifin Tube Company, London, Ontario.

*REGISTERED U.S. PAT. OFF.
**A PATENTED PROCESS RE. 22465

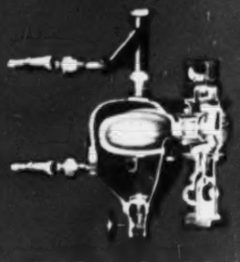
WOLVERINE TUBE

Division of Calumet & Hecla, Inc.

MANUFACTURERS OF QUALITY CONTROLLED TUBING AND EXTRUDED ALUMINUM SHAPES

PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES

EXPORT DEPARTMENT, 11 EAST 40TH STREET, NEW YORK 16, NEW YORK



No. 47-2 Feeder Cut-off Combination. The best kind of safety control for the average small steam boiler; maximum pressure, 25 lbs. Has cool feed valve, Quick Hook-up, straight-through blow-off valve and other McDonnell-developed features.

No. 247-2 Feeder Cut-off Combination. Companion to the No. 47-2, developed especially for service on smaller hot water space heating boilers. Maximum pressure, 30 lbs.

No. 51-2 Feeder Cut-off Combination. For larger boilers, both steam and hot water. Maximum pressure, 35 lbs.

No. 53-2 Feeder Cut-off Combination. For higher pressure boilers, up to 75 lbs. Used on both steam and hot water space heating boilers.

The horsepower in your boiler can get thirsty too!

Right from the start, let's get this straight: We're talking about hot water space heating boilers as well as steam heating boilers.

Both kinds can get thirsty. Both can run into a hazardous low water condition from any of a dozen and more reasons.

There's only *one* real answer to the question of a thirsty boiler. That is to install the device that automatically adds water to maintain a safe level in the boiler, then stands by to stop the firing if boiler water drops to a dangerous level.

McDonnell feeder cut-off combinations have been doing just that for many years. They are the best-known, most widely used controls of their kind. Make them a part of every boiler installation.

To have the facts handy, write for complete Catalog.

McDONNELL & MILLER, *Inc.*, 3500 N. Spaulding Ave.
Chicago 18, Ill.

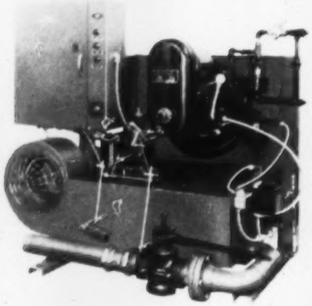
Doing One MM *Thing Well*

Your Jobber Stocks Them

McDONNELL *Boiler Water Level Controls*

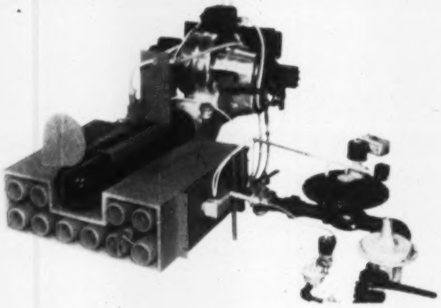
Webster DUAL FUEL FIRING BURNERS

The ROTONETIC*



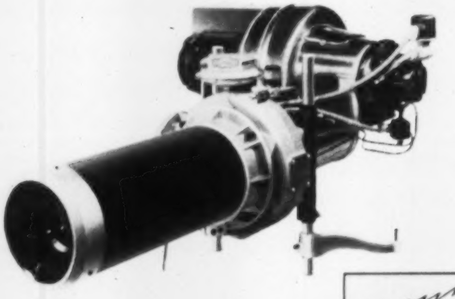
Dual Fuel Burner utilizing low pressure gas and any grade of commercial fuel oil under forced draft. Completely assembled, wired and tested at the factory; the units are available to 400 horsepower.

The DUONETIC*



Dual Fuel Burner combining the economy, efficiency and trouble-free operation of the WEBSTER KINETIC Gas Burner with a light oil burner with unique provisions to prevent coking of the oil nozzles. Capacities to 2.5 million Btu/hr.

The CYCLONETIC*



The Webster Cyclonetic* Dual Fuel Burner is designed to operate on either gas or light oil with only the flick of a switch necessary to change from one fuel to another.. Employing 100% forced draft, the Cyclonetic* provides fully automatic operation on both fuels, with complete programming and safety built in. Capacities from 675,000 to 4,000,000 Btu/hr.

*TRADE MARK

WRITE for LITERATURE

COMBUSTION EQUIPMENT
ENGINEERED BY THE WEBSTER ENGINEERING COMPANY

The WEBSTER ENGINEERING COMPANY
TULSA, OKLAHOMA
Division of SURFACE COMBUSTION CORPORATION, Toledo, Ohio

IN 1956...

get better performance . . . faster service with

B&G Cooling Equipment

NEW PACKAGE LIQUID COOLER

A complete cooling unit for homes, apartments, commercial and industrial buildings, process work. Design highlights include low pressure drop through evaporator—non-recycling pump-down—integrated electrical control system—low center of gravity for easy installation. Completely wired, including chiller and tower pump. Send for Bulletin HB-755.

Specifying "B&G" throughout for your air conditioning and refrigeration installations assures you of equipment known for quality—with a single manufacturer's responsibility for satisfactory operation.

B&G 1522 and 1531 Pumps, for example, have a long record for dependable economical and *quiet* performance. Among their many features is the "Remite" leakproof mechanical Seal—*harder than glass*—wear-proof!

B&G Evaporators, Condensers and other heat exchange equipment offer time-tested design—rugged construction—precision workmanship—all combined to provide top performance and long life. These units are built to ASME Code requirements.

Write today for a complete file of B&G air conditioning and refrigeration equipment literature.

BELL & GOSSETT
COMPANY
Dept. REE-5, Morton Grove, Illinois
Canadian Licensee: S. A. Armstrong, Ltd., 1400 O'Connor Drive, West Toronto

★ STOCK SERIES

FOR IMMEDIATE SHIPMENT

To give you fast service, most frequently used sizes of the units starred below are kept in factory stock for immediate delivery. Write for descriptive literature.

★ **B&G Series 1522 Pumps**

★ **B&G Series 1531 Pumps**

★ **B&G Model CRF Straight Tube Condensers**

★ **B&G Model CFG Shell and Coil Condensers**

★ **B&G Model LRS Liquid Receivers**

★ **B&G Series RG Heat Exchangers**

B&G Evaporators

make it a

One-Piece Pipeline

with WALSEAL®

. . . and you can *see* that it's made right. When you make a WALSEAL joint the fillet of silver brazing alloy *that appears at the face of the fitting* is your assurance of full penetration *and a permanently leak-proof joint* that's vibration proof and corrosion-resistant . . . won't creep or pull apart under any conditions that the pipe itself can withstand.

Walseal is a registered trade-mark which identifies valves, flanges and fittings manufactured by the Walworth Company. Walseal products have *factory-inserted* rings of silver brazing alloy in threadless ports. Joints made with Walseal products are silver brazed and actually make the system a "one-piece pipeline."

Your copy of Circular 115 giving details on Walseal valves and fittings will be sent on request . . . send for it or see your nearby Walworth distributor.

SEE OUR CATALOG IN SWEET'S

Make it a "one-piece pipeline" with Walseal

WALWORTH

valves and fittings

60 EAST 42nd STREET NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

From New York to Buffalo ...it's Sarcotherm at every point

BUFFALO
Rochester
Syracuse
Utica
Albany
NEW YORK CITY
427 MILE NEW YORK STATE THRUWAY

At all 40 toll interchanges heating systems controlled by Sarcotherm Weather-Compensated Systems

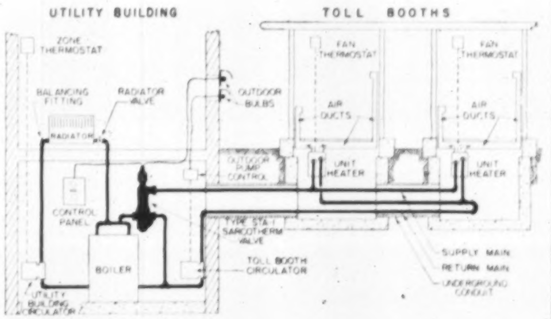
Mechanical Engineers: Syska & Hennessy, Inc., N.Y.C. • Heating Contractor: Mechanical Installations, Inc., L. I. City • Booths by Taller & Cooper, Brooklyn

HERE IN EFFECT is a heating system which stretches from the southeastern to the northwestern extremities of New York State.

It is obvious, therefore, that such a system must be so simple, so fool-proof, so utterly dependable, that any possibility of breakdown or other trouble will be reduced to an absolute minimum.

That is why *reliability* received so much attention from the Thruway's heating engineers. And that is one of the principal reasons why Sarcotherm Weather-Compensated Control Systems are installed in all 40 toll interchanges.

At each toll barrier a Sarcotherm Weather-Compensated Control System, calibrated to the design temperature for the particular locality, automatically proportions supply water to unit heaters in individual booths. Room thermostats control fan motors.


UTILITY BUILDING
TOLL BOOTHS
ZONE THERMOSTAT
BALANCING FITTING
RADIATOR VALVE
RADIATOR
OUTDOOR BULBS
FAN THERMOSTAT
FAN THERMOSTAT
AIR DUCTS
AIR DUCTS
OUTDOOR PUMP CONTROL
UNIT HEATER
UNIT HEATER
CONTROL PANEL
TYPE STA-1 SARCOTHERM VALVE
BOILER
TOLL BOOTH CIRCULATOR
SUPPLY MAIN
RETURN MAIN
UNDERGROUND CONDUIT
UTILITY BUILDING CIRCULATOR

Advantages of Sarcotherm Systems

Easy to install — tailor-made drawings and diagrams of the complete system are furnished for each job.

Easy to maintain — by regular maintenance men, because of simplicity; fewer parts, such as transformers, relays.

Easy to adjust — to any desired setting.

Complete control system — including all specialties such as radiator valves, balancing fittings — all from one manufacturer, Sarcotherm. Unit responsibility.

On the job assistance — to contractors from Sarcotherm's field engineers.

SARCOTHERM CONTROLS, Inc.

Empire State Bldg., New York 1, N. Y.

An affiliate of Sarco Company, Inc.

4002-C

Weather-Compensated Control Systems for **HOT WATER, RADIANT AND STEAM** *Heating*

Monarch
SPRAY NOZZLES

for

AIR WASHERS . . . COOLING TOWERS

These are "non-clogging" nozzles with a single large tangential lead hole to the swirl chamber that will never clog from any impurities small enough to pass through the orifice. Swirl chamber is conical on both ends and pivots liquid like a top to produce an exceptionally fine, evenly distributed, balanced spray of about 80° included angle. Wider spray angles up to 130° can be furnished to order.

Standard material Brass. Also available in Stainless Steel and Monel. Pipe sizes from ⅛″ to 1″. ¼″ size is 1-1/16″ long and made from ⅝″ square stock.

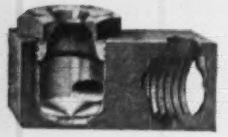


Fig. 631

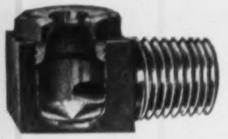


Fig. 629

CAPACITIES: GALLONS PER HOUR

Sizes			Lbs. Operating Pressure					
Pipe	Orifice	Lead	10	20	30	40	60	100
⅛″ OR ¼″	69	69			2.9	3.3	4.0	5.1
	61	61		4.0	5.0	5.5	7.0	8.7
	61	53	4.4	6.2	7.5	8.3	10.3	13.0
	53	53	5.8	8.2	9.8	10.9	14.1	17.3
	49	49	9.1	11.1	13.2	15.0	19.5	24.6
	3/32″	3/32″	11.8	16.6	20.4	23.4	29.0	36.5
	⅛″	3/32″	19.5	27.6	33.3	39.1	49.0	60.0
	⅛″	⅛″	24.3	34.6	42.8	50.0	64.0	78.5
	1/64″	⅛″	31.5	46.1	57.0	64.1	81.9	105
	3/16″	5/32″	52.2	75.0	92.5	109	138	189
¼″	7/32″	3/16″	78.0	112	138	163	205	257
	7/32″	7/32″	82.0	121	152	180	225	300

HUMIDIFIERS . . . . . . AIR CONDITIONERS

The H-261 and F-80 brass nozzles produce the finest, softest, fog-like spray possible with low direct pressure only. Popular sizes are nozzle #3.00 and #5.00 tested either 80° or 120° at 25 pounds.

All Brass construction with 120 mesh Monel screen strainers and ⅛″ or ¼″ female or ¼″ male pipe connection in the F-80 and ¼″ male only in the H-261. The H-261 is 1-⅜″ overall and the F-80, 1-⅞″.

Fig. H-261

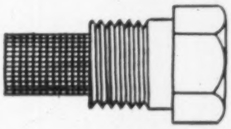
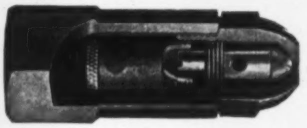
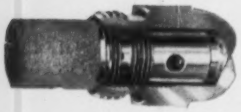


Fig. F-80



GALLONS PER HOUR

Nozzle No.	Lbs. Operating Pressure				
	25	40	60	80	100
1.35		.57	.69	.83	.92
1.65		.75	.89	.99	1.12
2.00		.94	1.14	1.28	1.40
2.50		1.13	1.45	1.64	1.86
3.00	1.03	1.39	1.62	1.85	1.95
3.50	1.36	1.77	2.11	2.46	2.80
4.00	1.56	2.00	2.42	2.77	3.16
4.50	1.86	2.32	2.77	3.21	3.68
5.00	2.20	2.88	3.57	4.09	4.59
5.50	2.22	2.96	3.75	4.31	4.78
6.00	2.55	3.35	4.01	4.78	5.23
7.00	2.90	3.91	4.60	5.17	6.00



OIL BURNERS

Monarch Stainless Steel Nozzles for high pressure gun-type oil burners are the Industry yardstick for nozzle performance. Each nozzle individually tested for capacity, spray angle and uniformity of spray on No. 2 fuel oil weighing 7.16 pounds per gallon at 74°F. and 34 S. S. U. viscosity at 100°F. Standard spray angles are 30°, 45°, 60°, 70° and 80° in small sizes.

Standard capacity sizes (GPH at 100 psi.): .60, .75 .85, 1.00, 1.20, 1.25, 1.35, 1.50, 1.65, 1.75, 2.00, 2.25, 2.50, 3.00, 3.50, 4.00, 4.50, 5.00, 5.50, 6.00, 6.50, 7.00, 7.50, 8.30, 9.50, 10.50, 12.00, 13.80, 15.30, 17.50, 19.50, 21.50, 24.00, 28.00, 30.00 to 60.0 in 5.00 GPH steps and 60.0 to 100.0 in 10.00 GPH steps.

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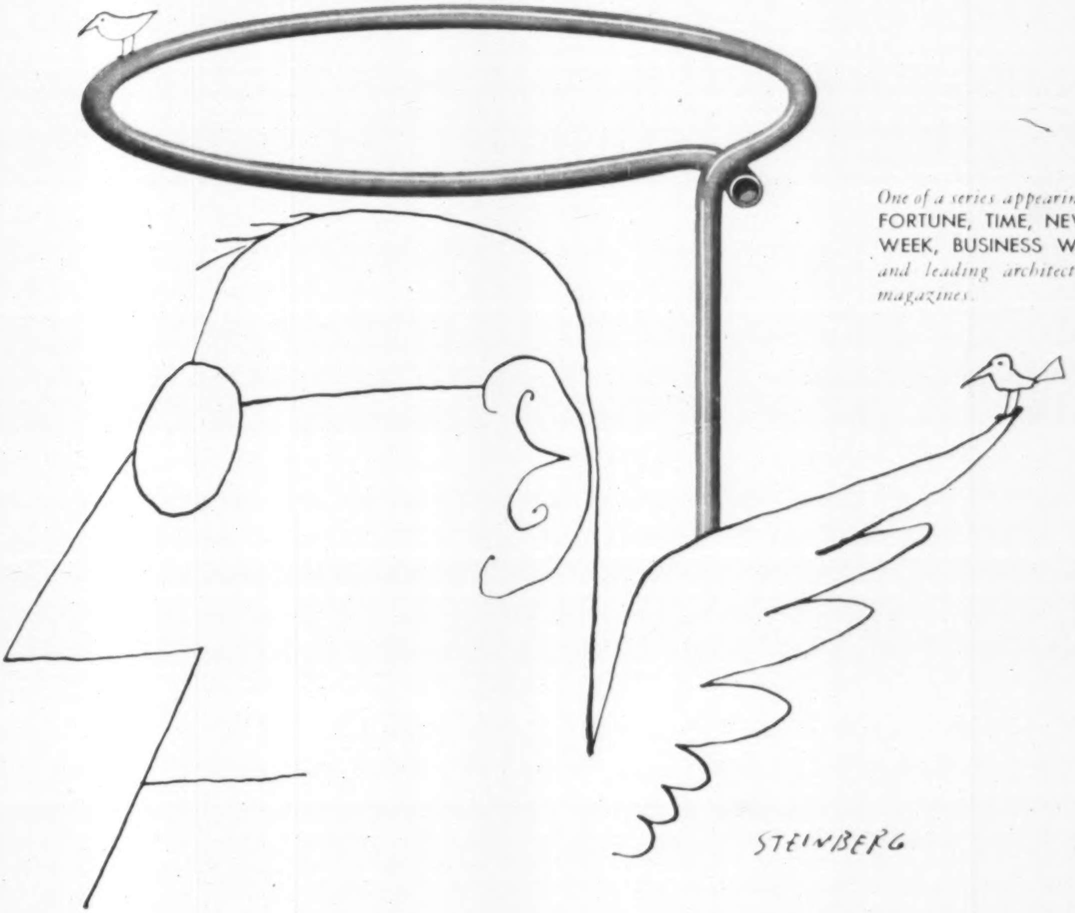

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MANUFACTURERS OF
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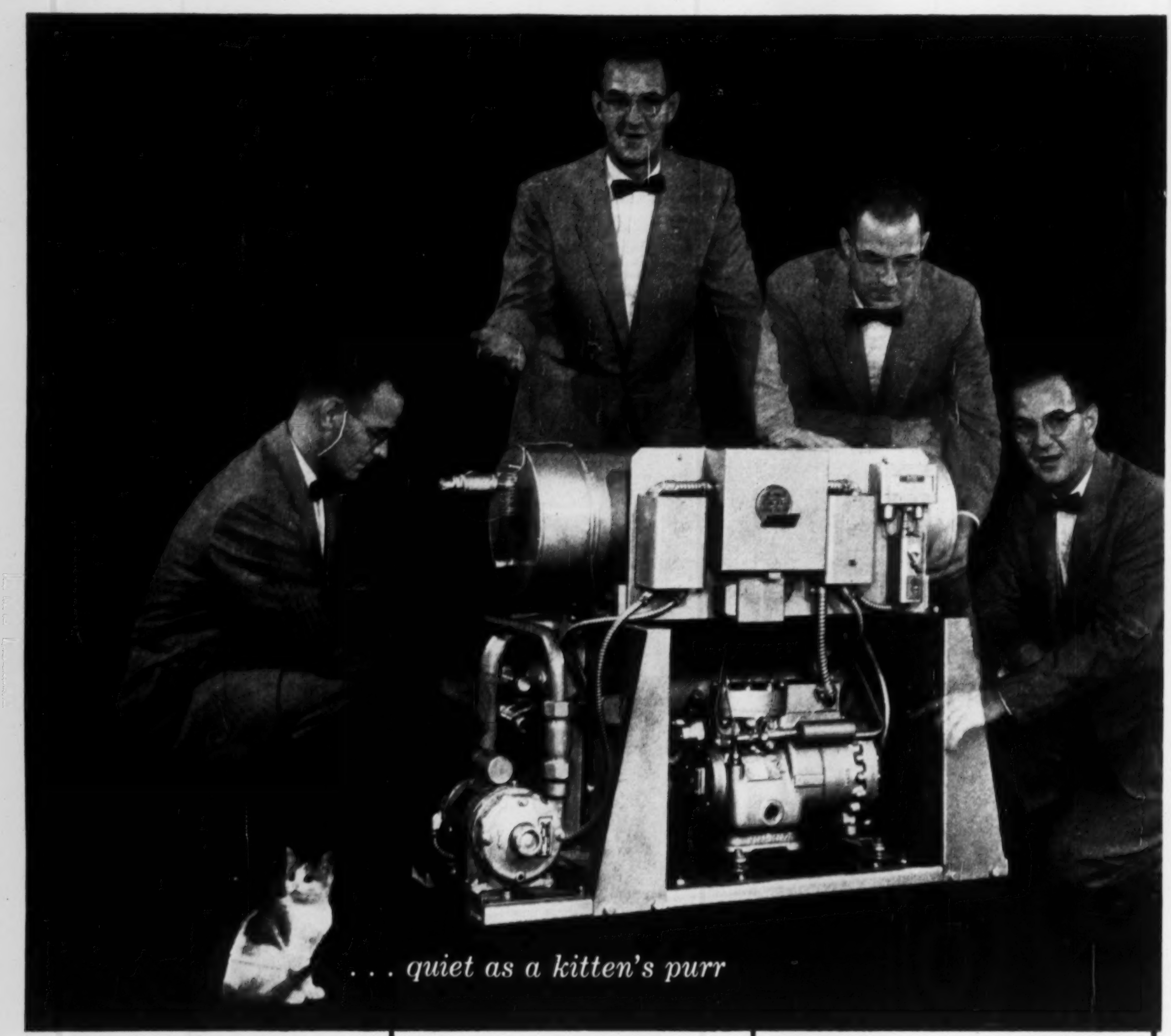

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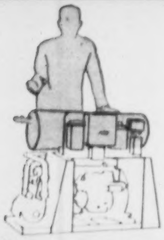
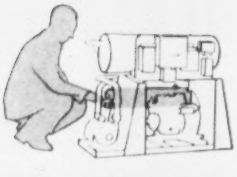


The Acme DRY EX® — recognized leader in the chiller field

Dry-Ex design puts extra chilling capacity in every inch of chiller space. Dry-Ex tubes are electronically rolled into the tube sheet openings — no internal joints, no trouble on the job!



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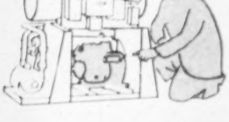
Acme's integral fin tubing and compact coil design puts extra heat transfer capacity in a size of condenser that adds to Flow-Cold's compactness.



Advanced design Acme Compressor — precision-built for quiet, dependable operation

New, accessible hermetic-type compressor has aluminum pistons — is dynamically and statically balanced for quiet, vibration-free performance.

A product of Acme Industries, Inc.—Manufacturers of Quality Air Conditioning and

Acme's new FLOW COLD

today's most advanced packaged chiller in the 3 thru 20-ton range

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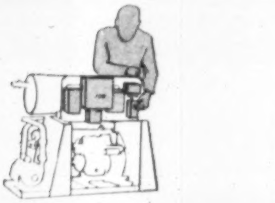
SIMPLE TO INSTALL AND OPERATE. With over 36 years of Acme field experience to draw from, Flow-Cold engineers design these packages with the contractor and use in mind. Fast, easy connections — trouble-free operation!

For packaged chiller capacities from 20 thru 300 tons, investigate the versatile Acme Flow-Therm. Standard or custom packages to fit your needs.



Accurate controls match unit operation to the load

All necessary controls are furnished to give fast, accurate response to system requirements. Compressor operates only when needed: power consumption and wear are minimized.

Refrigeration Equipment since 1919

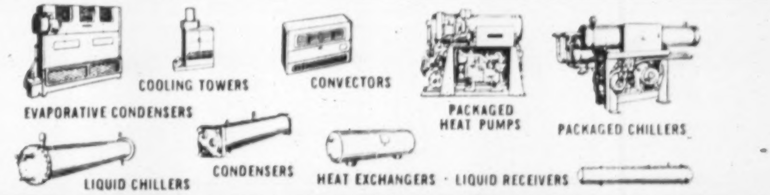


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FIG. 375—Bronze Gate Valve for 200 Pounds W.S.P.

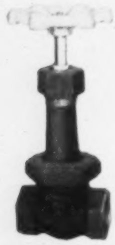


FIG. 2608—Bronze Full Flow Globe Valve for 200 Pounds W.S.P.

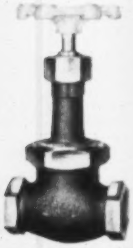
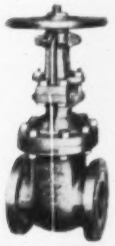


FIG. 1503—150-Pound Steel Gate Valve.



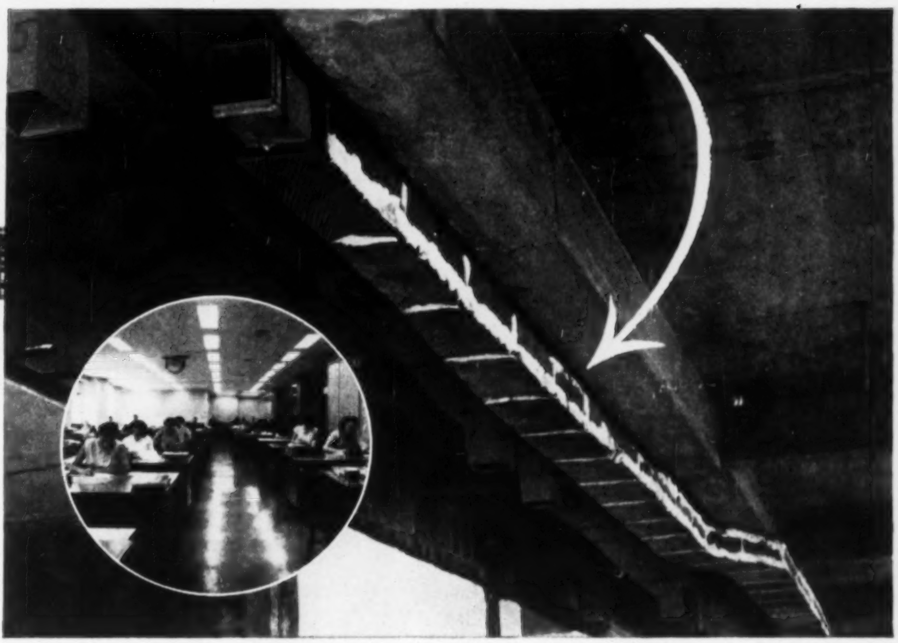
POWELL VALVES

BRONZE, IRON, STEEL AND CORROSION RESISTANT VALVES.

Above: New York City's new Chrysler Building East (foreground) and the original Chrysler Building erected some 20 years ago.

Right: Spintex insulation on the air-conditioning ducts serving offices in the Chrysler Building East. Applied by the Asbestos Construction Company, Inc. of New York, an outstanding J-M Insulation Contractor.

On air-conditioning ducts serving 420,000 sq ft of office space . . .



CHRYSLER BUILDING EAST SPECIFIES J-M *Spintex* DUCT INSULATION FOR YEAR 'ROUND OFFICE COMFORT

Running through the 32 stories of the new companion structure to the original Chrysler Building are miles of air-conditioning ducts . . . all insulated with Johns-Manville Spintex.

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Johns-Manville flexible, semi-rigid and rigid insulations for air-conditioning ducts meet every industrial requirement. Basically mineral products, each type has its particular characteristics that make it specially suitable for a specific air-conditioning service. All have the low heat transfer properties that are needed for high insulating efficiency.

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For further information, write for a copy of Brochure IN-135A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ont.

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J-M Insulation applicators applying Spintex on an air-conditioning duct. Thoroughly familiar with J-M insulating materials and application methods, these men have the skill that assures maximum dividends in greater fuel and power savings over the years.

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Men and machines bring news to you

American Blower plays vital role in air conditioning one of the world's largest newspaper plants

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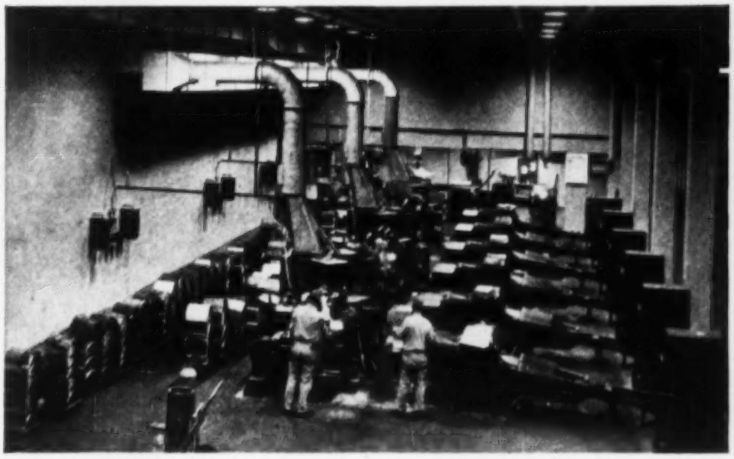
A relatively high humidity in the press room is a must – for the speeding miles of paper could tear if too dry, and cause a delay. This added moisture, precisely controlled, also improves printing. The stereotype section, however – where lead printing plates are cast – calls for different treatment. Here, American Blower ventilating equipment works 'round the clock to rid the area of heat generated by the metal pots.

Considered by many as "the mechanical showcase of modern journalism," the new Bulletin Building requires varied air conditions throughout its over 500,000 sq. ft. area. For cooling, heating, ventilating, air filtering, humidifying, and dehumidifying – both men and machines depend on 78 American Blower units in the race of getting news to readers faster.

You can count on American Blower, too . . . whether your air-conditioning needs are large or small, normal or unusual. Just phone our representative near you.

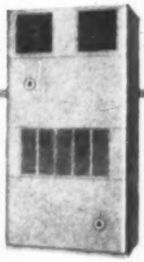
THE EVENING AND SUNDAY BULLETIN

New Bulletin Building. Architects: George Howe & Robert Montgomery Brown. Mechanical Contractors: Riggs Distler & Company, Inc. Special Consultants: William Ginsberg Associates. Consulting Engineers: A. Ernest D'Ambly; Pennell & Wiltberger; Keast & Hood.



In the section where printing plates are made, there is 'round-the-clock ventilation . . . to exhaust heat generated by the melting and casting of lead.

faster—thanks to conditioned air



In addition to equipment for complete central systems—American Blower offers packaged air conditioners for offices, stores, industrial plants, and similar applications.

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IT'S AIRTEMP *AIR CONDITIONING IN PRIZE-WINNING FORT BROWN* memorial center

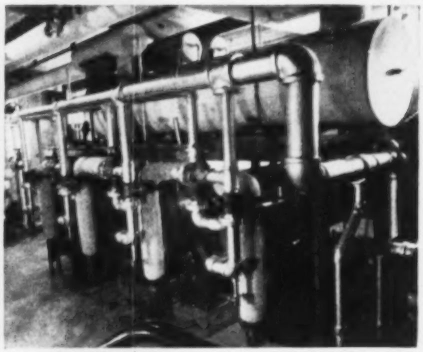
HERE'S MORE EVIDENCE OF TREND TO AIRTEMP AMONG LEADING U. S. ARCHITECTS!

Airtemp air conditioning is *famous* for trouble-free performance—just the smooth-running result you'd expect from 21 years of advanced engineering by Chrysler. And when you install Airtemp, you're giving your clients the best assurance of low operating costs—year after year.

Whether your job is large or small, in the complete Airtemp line of equipment for all systems of modern air conditioning, you will find the *exactly right* equipment for every requirement.

When you air condition with Airtemp you can make *doubly* sure that your installations are right in every detail by utilizing the advisory services of *top engineers* of Airtemp Construction Corporation. And to safeguard your installations through the years ahead, there are Airtemp-trained *personnel* and service *facilities* right on the spot in every major community.

So remember, next time you're planning commerical or industrial air conditioning . . . specify AIRTEMP. Get the best equipment for the job *plus* the complete air conditioning service that will relieve you of many problems.



250 TONS OF COOLING! Two Airtemp Liquid Chilling systems provide water for cooling cycle in air conditioning of Fort Brown Memorial Center. Heart of each unit is the Airtemp Variable-Capacity Radial Compressor with exclusive design which saves space, reduces compressor weight. Quiet operation is due to perfect balance and reduced vibration.

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Of the six Reed tools shown here, five have been introduced within the last three years. And every tool on this page has exclusive performance features which can save as much as half of the time and energy you're using with ordinary tools. Check up and see!

. . . in a Vise or Pipe Tool
If it's Reed — it's Right!

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Does everything an ordinary pipe wrench will do . . . and a great deal more. Gets into tight corners; holds or turns any shape. Rachet-like action works in either direction. 10" to 60" handle lengths. Renewable jaws.

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HINGED 4-WHEEL CUTTER

Until you've used it, you can't believe how quickly this completely new tool cuts off cast iron or steel pipe. Tracks perfectly, cuts easily and clean . . . in ditch work, in tight corners or in the open. In five sizes for pipe to 12 inches.

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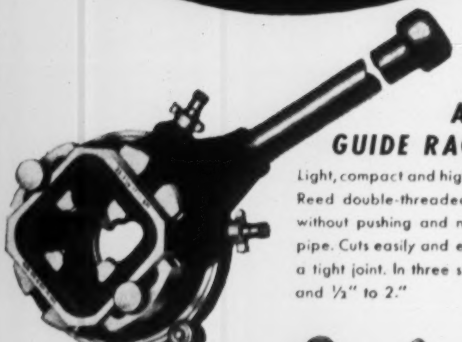

ADJUSTABLE GUIDE RACHET THREADER

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RACHET REAMER

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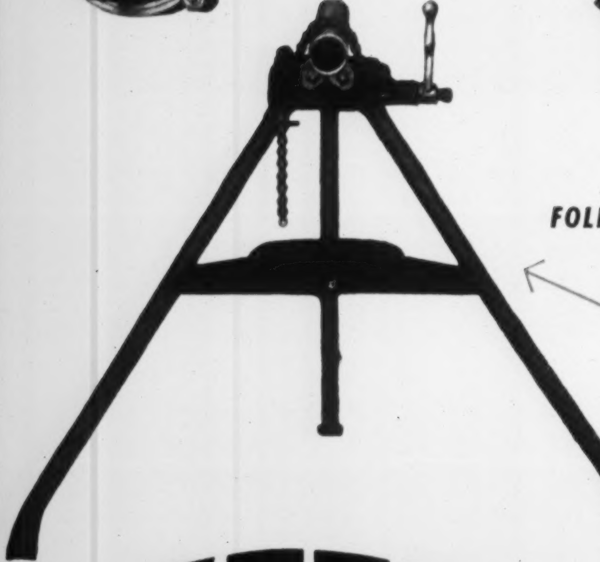
CHAIN BENCH VISE

A sturdy and greatly improved chain bench vise. Chain drops naturally into position and locks automatically. Easy-to-use handle ends fumbling and skinned knuckles. In five sizes with capacities from ⅛" to 2" to ½" to 8."



FOLDING TRAY TRIPOD VISE

The famous folding tray tripod is available with the long-jaw yoke vise or the new chain vise head. Folds compactly, carries easily. Sets up instantly, solid as a rock, and won't collapse while you're working. Yoke vise capacity ⅛" to 2½"; chain vise capacity ½" to 4."

☆ - - - - *The distributors who feature Reed Pipe Tools believe in the best for their customers. You'll enjoy doing business with them.*

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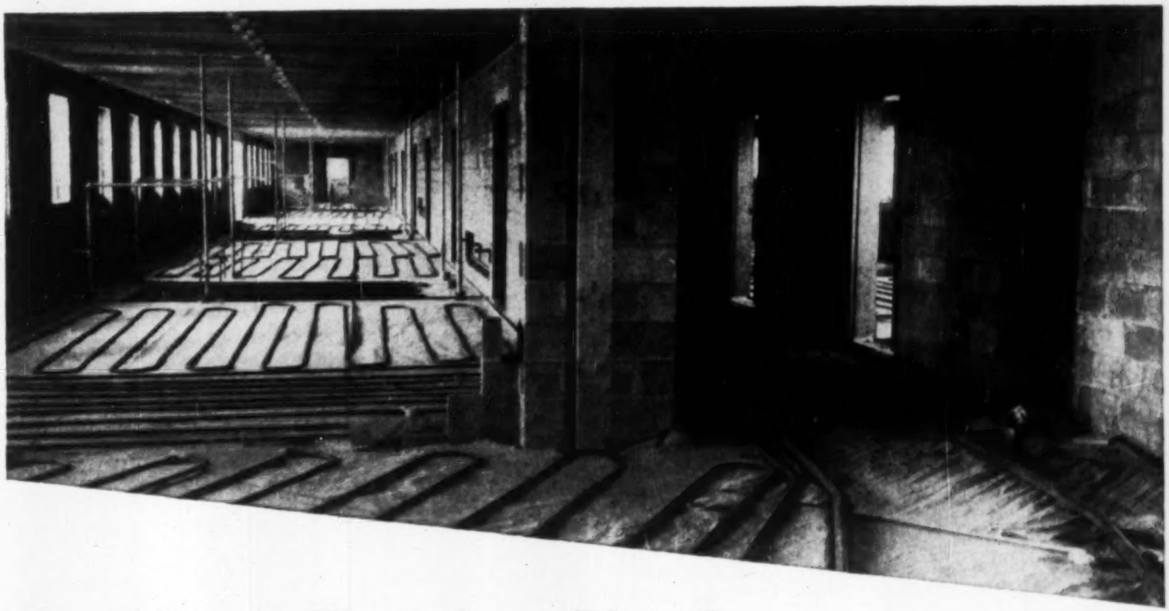

Radiant Heating Used to Provide Maximum Comfort for Cerebral Palsy Patients

A complete radiant heating system of USS National Steel Pipe has been installed at the Walter D. Matheny School for Cerebral Palsy Children, Peapack, N. J., to insure heating comfort for the patients and to keep operating costs of the institution at an efficient low.

The majority of the pipe used in private rooms was $\frac{3}{4}$-inch standard. Supply mains through the hallways were laid in sizes up to 2 inches diam.

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Write *now* for complete details on the use of USS National Steel Pipe for radiant heating and snow melting applications. Ask for Bulletin No. 19. And keep National in mind for your next installation.

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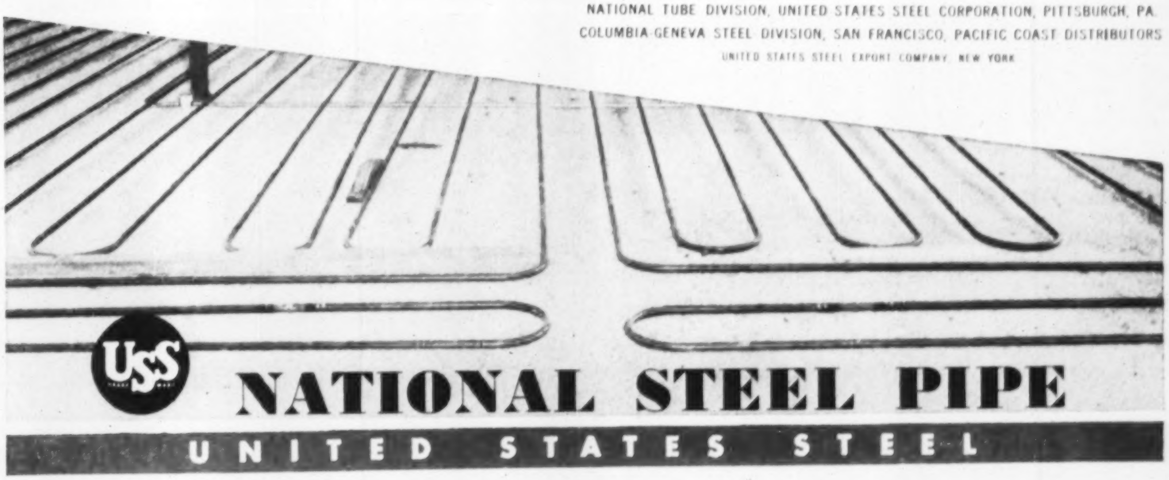
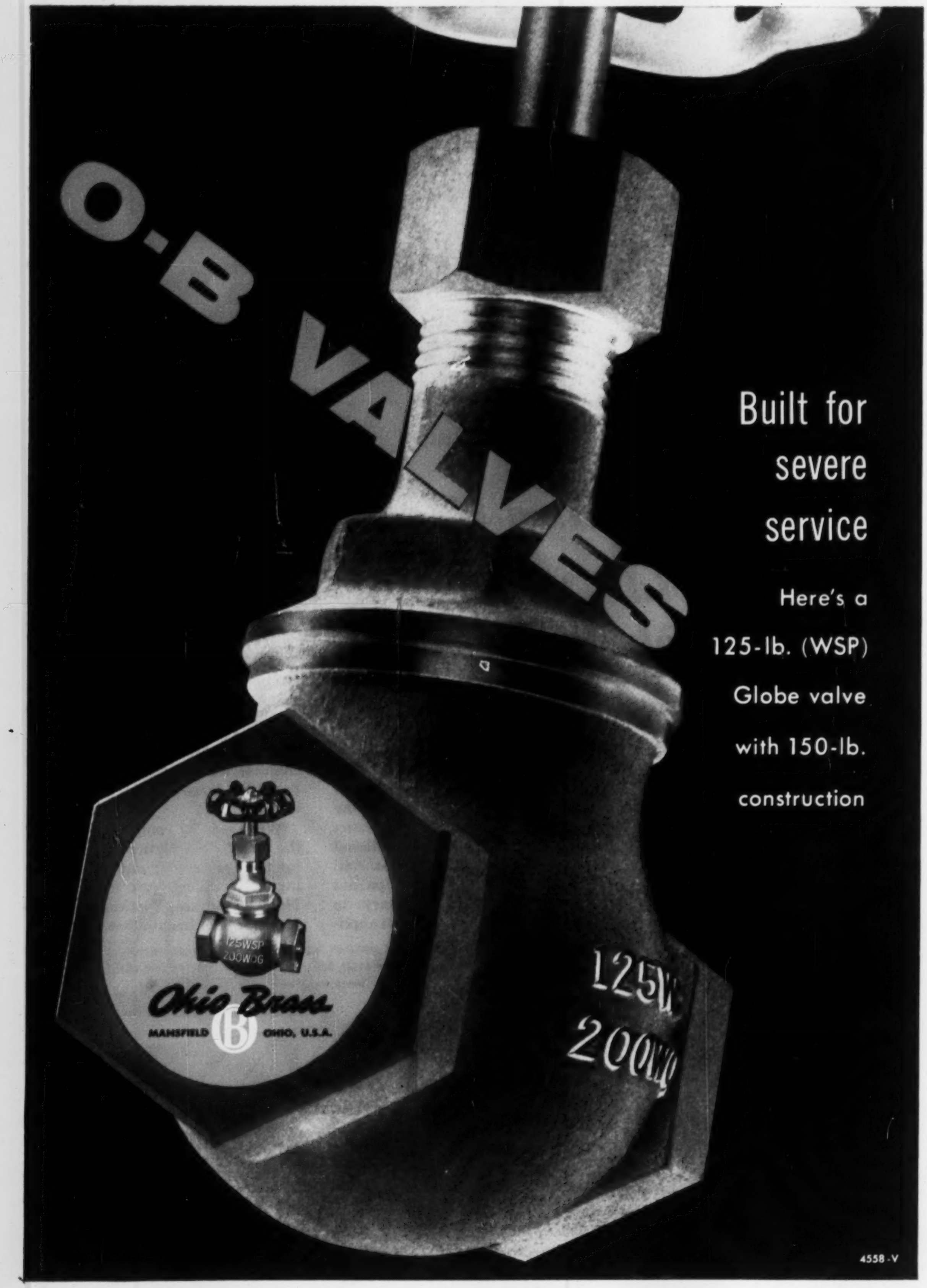


USS

NATIONAL STEEL PIPE

UNITED STATES STEEL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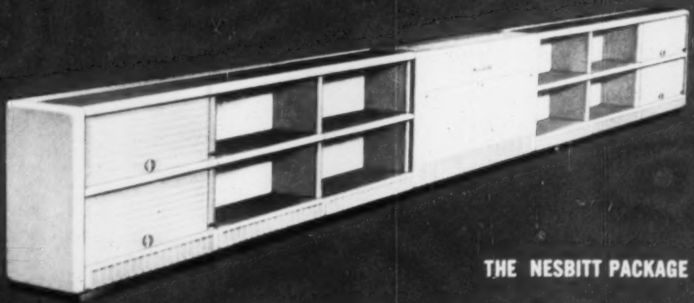
TODAY'S NESBITT PRODUCTS – INSIDE

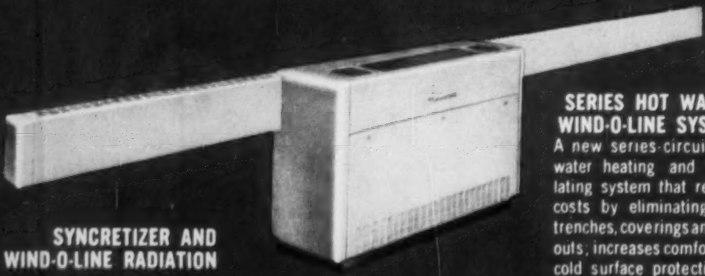
THE NESBITT SYNCRETIZER

The unit ventilator that sets a new standard of classroom comfort. Four models 32" and 28" high, 750 to 1560 CFM. **Publication 100**



THE NESBITT PACKAGE

Syncretizer and Wind-o-line Radiation integrated with Storage Cabinets for classroom beauty, utility, daylong comfort and overnight protection. Ensembles 32" and 28" high, **Publication 101**



SYNCRETIZER AND WIND-O-LINE RADIATION

For positive protection against cold surfaces. Integrated with the Syncretizer, Wind-o-line provides convected and radiated heat along room perimeters, achieves a symmetrical thermal environment. Capacities 450, 550 and 700 Btu/lineal foot. **Publication 101**

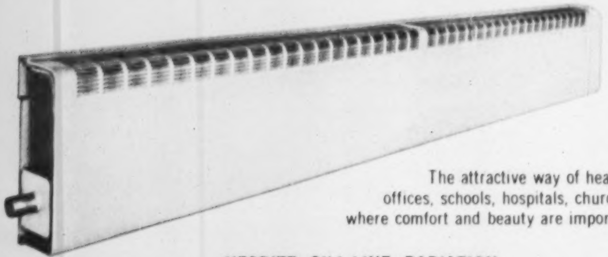
SERIES HOT WATER WIND-O-LINE SYSTEM

A new series-circuit hot water heating and ventilating system that reduces costs by eliminating pipe trenches, coverings and run-outs; increases comfort and cold surface protection by use of variable water temperatures. **Publication 104**

THE NESBITT THERMOVENT

For heating and ventilating large interiors. Exclusive sound-insulated plenum. Choice of models, 1250 to 15000 CFM. **Publication 270**

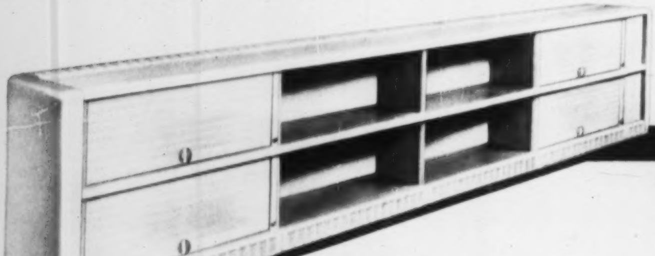
This is today's Nesbitt Line of Heating Ventilating and Air Conditioning Equipment



The attractive way of heating offices, schools, hospitals, churches where comfort and beauty are important

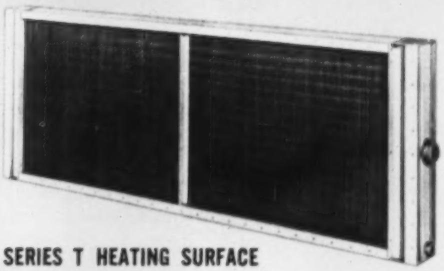
NESBITT SILL-LINE RADIATION

Modern high capacity finned radiation in casings styled for today's interiors. Rigid, long-life construction, draft-free comfort, low installation cost. Standard lengths, approved ratings 2.9 to 12.1 sq. ft. EDR, every needed accessory. **Publication 102**



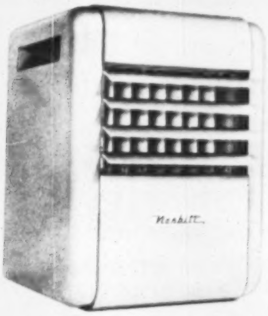
SILL-LINE WITH STORAGE UNITS

Combining the advantages of perimeter heating with the utility of attractive storage units at moderate cost. Ensembles 32" and 28" high, capacities 725 to 2750 Btu/lineal foot. **Publication 102S**



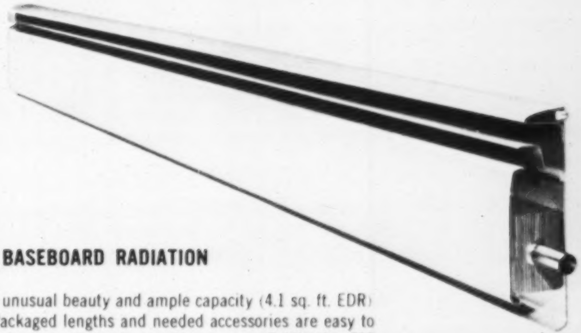
SERIES T HEATING SURFACE

With Nesbitt trombone steam-distributing tubes. Eliminates stratification and freezing under modulated control. Types TS and TO, lengths from 12" to 120". **Publication 305**



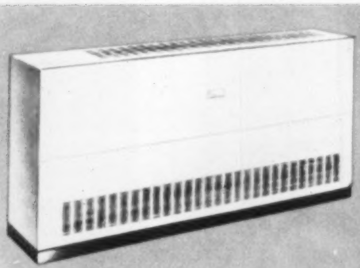
NESBITT GAS-FIRED UNIT HEATER

Seven models, 25,000 to 200,000 Btu input. A.G.A. and U.L. approved for all gases. **Publication 280**



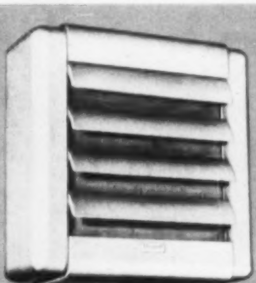
NESBITT BASEBOARD RADIATION

A practical design combining unusual beauty and ample capacity (4.1 sq. ft. EDR) for true perimeter heating. Packaged lengths and needed accessories are easy to buy and install—save time and money. Code approved. **Publication 272**



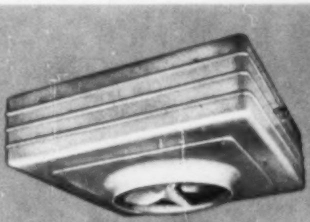
NESBITT SERIES C UNIT HEATER

Cabinet heaters in 5 sizes, 34" to 74½"; recess, semi- or non-recess; 4 mountings. Steam or water, 107 to 618 sq. ft. EDR. **Publication 403**



PROPELLER FAN UNIT HEATER

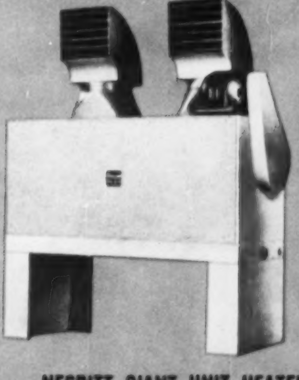
Universal heating elements for steam or hot water. Eight basic sizes, 15,000 to 335,000 Btu/hr. **Publication 401**



LITTLE GIANT UNIT HEATER

Propeller fan unit heaters with blower fan performance characteristics. Eight sizes, 28,500 to 510,000 Btu/hr. **Publication 402**

Foremost in the field of schoolroom heating and ventilating are Nesbitt Syncretizers, Wind-o-line Radiation and Storage Cabinets. Sill-line Radiation, with or without storage cabinets, is for schools, churches, hospitals and offices. Nesbitt Baseboard Radiation is ideal for residences. Giant, Little Giant, Propeller Fan, Gas Fired, and Series C Unit Heaters meet every industrial and commercial requirement. For air conditioning systems Nesbitt makes Heating and Cooling Surface.



NESBITT GIANT UNIT HEATER

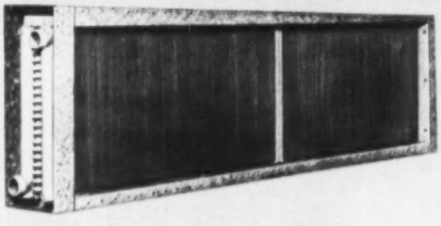
Heating and/or ventilating units, free or static delivery, steam or hot water. Wide capacities, 12 models; 1, 2, 3-fans. **Publication 404**

NESBITT SERIES H HEATING SURFACE

(not illustrated)

General purpose blast coil surface for heating, ventilating, air conditioning and drying in both high and low pressure systems. Copper tubes, aluminum or copper fins. Made in seven types, full range of sizes and capacities.

Publication 248



NESBITT SERIES W WATER SURFACE

For air cooling, dehumidifying, heating. Continuous tube types: Freeze-proof WD with drain and pitched in the casing; WB without drain. **Pub. 246.** Cleanable-tube WC. **Pub. 255**

Publications, one or all, free on request

FOR SALES AND SERVICE ON

Nesbitt

HEATING AND VENTILATING EQUIPMENT

SEE LIST ON NEXT PAGE

Where to Buy NESBITT
HEATING AND VENTILATING PRODUCTS

CREATING BETTER PRODUCTS FOR INDOOR THERMAL COMFORT

SALES OFFICE DIRECTORY, LISTED ALPHABETICALLY BY CITIES, FOR THE VARIOUS GROUPS OF PRODUCTS MADE BY NESBITT

GROUP 1
SCHOOLHOUSE HEATING AND VENTILATING EQUIPMENT

The Nesbitt Syncretizer, Nesbitt Wind-o-line Radiation, The Nesbitt Package, Nesbitt Thermovent, Nesbitt Sill-line with Storage Units, and Nesbitt DeLuxe Cabinet Heaters are sold through offices of the American Blower Corporation (ABC) and John J. Nesbitt, Inc. (JJN) as follows:

City and State	Street Address	Telephone
ALBANY 7, N. Y. (JJN)	93 State Street, Room 43	Albany 6-7661
ALBUQUERQUE, N. M. (ABC)	112 W. Granite Avenue	3-2247
ATLANTA 5, GA. (ABC)	3224 Peachtree Rd., N.E.	Exchange 8604
BALTIMORE 18, MD. (JJN)	33 E. 21st Street	Belmont 5-5895
BILLINGS, MONT. (ABC)	3308 Fourth Ave., North	2-0800
BIRMINGHAM 3, ALA. (ABC)	1638 Brown Marx Building	7-2383
BOSTON 15, MASS. (JJN)	236 Huntington Avenue	Copley 7-4202
BRYN MAWR, PA. (JJN)	765 W. Lancaster Ave.	Lawrence 5-8585
BUFFALO 16, N. Y. (JJN)	1441 Hertel Avenue	Delaware 3739
CHARLESTON 23, W. VA. (ABC)	1029 Virginia St., E.	6-1331
CHARLOTTE 2, N. C. (ABC)	1202 Commercial Bank Bldg.	Edison 3-8444
CHICAGO 1, ILL. (ABC)	228 N. LaSalle Street	Financial 6-2531
CINCINNATI 2, OHIO (ABC)	1005-6 American Bldg.	Parkway 1-8160
CLEVELAND 15, OHIO (ABC)	1010 Euclid Avenue	Main 1-6846
COLUMBUS, OHIO (JJN)	101 N. High St., Room 302	Capitol 4-7559
DALLAS 2, TEXAS (ABC)	1213 Texas Bank Bldg.	Prospect 1879-70
DAYTON 2, OHIO (ABC)	3rd National Building	Hemlock 2689
DENVER 4, COLO. (ABC)	1304 Cherokee Street	Main 3179
DES MOINES 9, IOWA (ABC)	418 Seventh Street	8-5691
DETROIT 2, MICH. (ABC)	632 Fisher Building	Trinity 2-4300
EL PASO, TEXAS (ABC)	609 Laurel Street	3-7575
FORT WAYNE 2, IND. (ABC)	517 Gettle Building	Eastbrook 7673
GRAND RAPIDS 2, MICH. (ABC)	211 Assn. Commerce Bldg.	Glendale 8-1357
GREENVILLE, S. C. (ABC)	105 Palmetto Building	2-4286
HARRISBURG, PA. (JJN)	835 S. 13th Street	Cedar 8-8144
HOUSTON 2, TEXAS (ABC)	1909 Travis Street	Capitol 7-6171
INDIANAPOLIS 4, IND. (ABC)	619-21 Architects & Builders Building	Melrose 5-4521
JACKSONVILLE 7, FLA. (ABC)	Suite 16, 1628 San Marco	Exbrook 8-0826
KANSAS CITY 5, MO. (ABC)	330 Dwight Building	Victor 7181
KNOXVILLE 8, TENN. (ABC)	223 Empire Building	4-1668

City and State	Street Address	Telephone
LOS ANGELES 17, CALIF. (ABC)	506 Architects Bldg.	Michigan 3871
LOUISVILLE 2, KY. (ABC)	1622 Heyburn Building	Jackson 7109
MEMPHIS 3, TENN. (ABC)	658 S. Main Street	8-0339
MEXICO CITY, MEX. (ABC)	San Juan deLetran #37, Apartado 403	
MIAMI 33, FLA. (ABC)	3356 Virginia Street	Highland 8-3916
MILWAUKEE 3, WIS. (ABC)	231 W. Wisconsin Ave.	Broadway 1-6691
MINNEAPOLIS 3, MINN. (ABC)	402 Essex Building	Filmore 7215
NASHVILLE 5, TENN. (ABC)	1805 Hayes Street	Chapel 2-1354
NEW ORLEANS 12, LA. (ABC)	305 Jahncke Building	Tulane 7105
NEW YORK 7, N. Y. (JJN)	11 Park Place	Barclay 7-0260
OMAHA 2, NEBRASKA (ABC)	305 Patterson Building	Atlantic 7464
ORANGE, N. J. (JJN)	285 Main Street	Orange 3-5873
PHILADELPHIA 36, PA. (JJN)	State Road & Rhawn St.	Devonshire 2-2400
PHOENIX, ARIZ. (ABC)	Central Madison Building	Alpine 2-4641
PITTSBURGH 34, PA. (JJN)	732 Castle Shannon Blvd.	Locust 3-0200
PORTLAND 5, ORE. (ABC)	445 Pittock Block Bldg.	Atwater 2116
RICHMOND 19, VA. (ABC)	American Building	7-5630
ROCK ISLAND, ILL. (ABC)	210 Safety Building	6-6425
ST. LOUIS 1, MO. (ABC)	1711 Railway Exchange Bldg.	Garfield 1-1208
SALT LAKE CITY 1, UTAH (ABC)	204 Dooly Building	4-6421
SAN FRANCISCO 5, CALIF. (ABC)	625 Market Street	Sutter 1-1024
SEATTLE 9, WASH. (ABC)	1305 Republican Street	Seneca 5860
SOUTH BEND 1, IND. (ABC)	211 Lafayette Building	Central 3-9305
SPRINGFIELD, MASS. (JJN)	Room 412, 1537 Main Street	Republic 2-1878
SYRACUSE, N. Y. (JJN)	1105 State Tower Building	Syracuse 2-9202
TAMPA 1, FLA. (ABC)	509 Twiggs Street	2-2506
TOLEDO 12, OHIO (ABC)	4359 Kingsbury Avenue	Lawndale 7297
TULSA 3, OKLA. (ABC)	404 Wright Building	Luther 3-5223
WASHINGTON 5, D. C. (ABC)	942 Washington Building	National 8-2872
YOUNGSTOWN 5, OHIO (ABC)	3119 Market Street	Sterling 8-6525

In Canada these products are sold through Canadian Sirocco Company, Ltd., P. O. Box 360, 310 Ellis Street, Windsor, Ontario

GROUP 2

Complete sales and service for Nesbitt Baseboard Radiation, Nesbitt Giant, Little Giant, Propeller Fan, Series C and Gas-Fired Unit Heaters, Nesbitt Sill-line Radiation, Nesbitt Heating and Ventilating Units, and Nesbitt Heating and Cooling Surfaces are provided by the following offices:

ALBANY 7, NEW YORK	93 State Street, Room 43	Albany 6-7661
ATLANTA, GEORGIA	302 Ponce De Leon Ave., N.E.	Vernon 0241
BALTIMORE 18, MARYLAND	33 E. 21st Street	Belmont 5-5895
BIRMINGHAM, ALABAMA	745 N. 44th Street	9-6648
BOSTON 15, MASSACHUSETTS	236 Huntington Avenue	Copley 7-4202
BUFFALO 16, NEW YORK	1441 Hertel Avenue	Delaware 3739
BRYN MAWR, PENNSYLVANIA	765 W. Lancaster Avenue	Lawrence 5-8585
CHARLOTTE, NORTH CAROLINA	P. O. Box 1867	Edison 2-3550
CINCINNATI, OHIO	1284 Bursal Avenue	Beechmont 1-8722
CLEVELAND, OHIO	29025 Ridge Road	Wickliffe 1642
COLUMBUS, OHIO	P. O. Box 945	Capitol 1-2565
DAYTON, OHIO	P. O. Box 925	Oxmoor 7171
DENVER, COLORADO	P. O. Box 2544	West 4-3156
DETROIT, MICHIGAN	1713 Anita Avenue	Tuxedo 4-2040
HARRISBURG, PENNSYLVANIA	835 S. 13th Street	Cedar 8-8144
HOUSTON, TEXAS	P. O. Box 6983	Mohawk 5-0396
INDIANAPOLIS, INDIANA	1531 Pennsylvania Street	Melrose 4-3463
JOHNSTOWN, PENNSYLVANIA	206 Fisher Building	Johnstown 9-4108
LANCASTER, PENNSYLVANIA	R. D. 20, Providence Road	Lancaster 4-9181
LOS ANGELES, CALIFORNIA	714 W. Olympic Boulevard	Richmond 7-5101
LOUISVILLE, KENTUCKY	1031 W. Main Street	Jackson 2556
MILWAUKEE, WISCONSIN	4206 N. Wilson Drive	Woodruff 2-5603
NEW YORK 7, NEW YORK	11 Park Place	Barclay 7-0260
NORFOLK, VIRGINIA	316 W. 28th Street	3-9567
ORANGE, NEW JERSEY	285 Main Street	Orange 3-5873
ORLANDO, FLORIDA	214 Church & Main Bldg.	2-2252
PHILADELPHIA 36, PENNA.	State Road & Rhawn Street	Devonshire 2-2400
PITTSBURGH 34, PENNA.	732 Castle Shannon Blvd.	Locust 3-0200
PORTLAND, OREGON	2925 N.E. Glisan	Belmont 2-2977
PORTSMOUTH, VIRGINIA	4401 Clifford Street	
RICHMOND, VIRGINIA	731 Northside Avenue	7-8762
ST. LOUIS, MISSOURI	24 Green Acres	Underhill 7-9145
ST. PAUL, MINNESOTA	568 N. Snelling Avenue	Midway 4-3046
SAN FRANCISCO, CALIFORNIA	115 New Montgomery Ave.	
SCRANTON, PENNSYLVANIA	1502 N. Adams Avenue	Diamond 3-7318
SEATTLE 9, WASHINGTON	1800 Taylor Avenue	Garfield 4825
SPRINGFIELD, MASSACHUSETTS	1537 Main Street, Room 412	Republic 2-1878
SYRACUSE, NEW YORK	Rm. 1105 State Tower Bldg.	Syracuse 2-9202
TERRE HAUTE, INDIANA	721 Prospect Street	Crawford 5931

GROUP 3

The following offices offer Nesbitt Heating and Cooling Surfaces exclusively:

DAVENPORT, IOWA	320 Western Avenue	7-6123
DES MOINES 9, IOWA	1112 Locust Street	8-5721
GREENVILLE, SOUTH CAROLINA	104 E. Stone Avenue	3-7488
OKLAHOMA CITY, OKLAHOMA	1604 N.W. 5th Street	Forest 5-6351
SALT LAKE CITY, UTAH	44 W. 8th Street, South	Davis 2-2537
TULSA, OKLAHOMA	P. O. Box 1137	Diamond 3-1101
WOODWARD, OKLAHOMA	P. O. Box 683	Woodward 1426

JOHN J. Nesbitt INCORPORATED

Main Office and Factory: HOLMESBURG, PHILADELPHIA 36, PA. — Telephone DEvonshire 2-2400

Pub. AP-156

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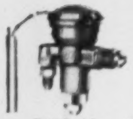
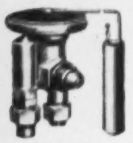
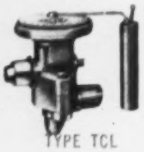
THERMO EXPANSION VALVES


TYPE 40

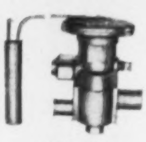
with pressure limiting feature


TYPE TK

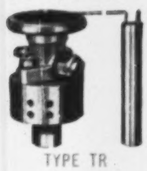
"3 valves in 1"


TYPE TCL

with angle connections


TYPE TCL

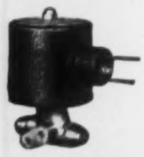
with straight-thru connections


TYPE TR

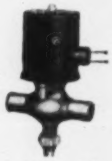
Multi-Outlet

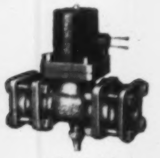
For automatic control of liquid refrigerant on all types of refrigeration and air conditioning systems. Capacities: from fractional tonnage to 220 tons Freon-12, 350 tons Freon-22; selective charges. Low temperature valves for −40°F to −100°F.

SOLENOID VALVES


TYPE S1

TYPE S2


TYPE M3


TYPE R2

For all types of service. For liquid: Freon-12 up to 75 tons; 110 tons Freon-22. For suction: Freon-12 up to 10 tons; 15 tons Freon-22. For brine, water, steam, hot gas discharge, air and oil.

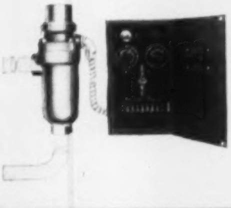
FLOAT VALVES AND SWITCHES

TYPE HK

high pressure float valve. Up to 5 tons Freon-12, 8 tons Freon-22 and 20 tons Ammonia.

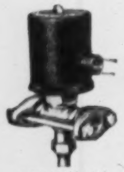
TYPE J5

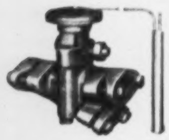
electric float switch. For Freon, Methyl Chloride, Ammonia and other non-corrosive liquids having a specific gravity of .6 or more. Up to 230 volts AC or DC.

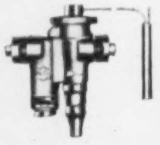

908 LECTRO-LEVEL

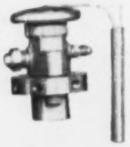
electronic remote control of liquid level. Accurate control for full-flooded evaporators. Adjustable to a wide range of level changes. Easy-to-set control dials conveniently mounted in remote box.

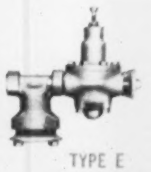
AMMONIA CONTROLS


TYPE M91F


TYPE TG


TYPE UG


TYPE TX


TYPE E

with strainer

Solenoid Liquid Valves — up to 172 tons. Solenoid Suction Valves — up to 28 tons. Thermo Expansion Valves — from fractional tonnage to 125 tons. Automatic Expansion Valves — from fractional tonnage to 60 tons.

SUCTION LINE CONTROLS

TYPE EPR

EVAPORATOR PRESSURE REGULATORS

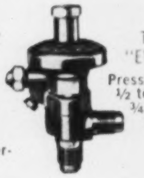
For all refrigerants, with connection sizes up to 6"

TYPES 771-772

SUCTION PRESSURE REGULATORS

(Hold-Back Valves)

Prevent motor overload. Freon-12, Freon-22.


TYPE 760

"EVAPOTROL"

Pressure regulator — ½ ton, Freon-12 — ¾ ton, Methyl Chloride.

ALCO VALVES

the complete line of refrigerant controls

ALCO

For capacities in excess of those listed, write us and give specific requirements.

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Constant Pressure (Automatic) Expansion Valves — Reversing Valves — Liquid and Suction Line Strainers.

ALCO VALVE CO.

861 KINGSLAND AVE. • ST. LOUIS 5, MO.

YOU'RE PROTECTED 3 WAYS WHEN YOU INSTALL

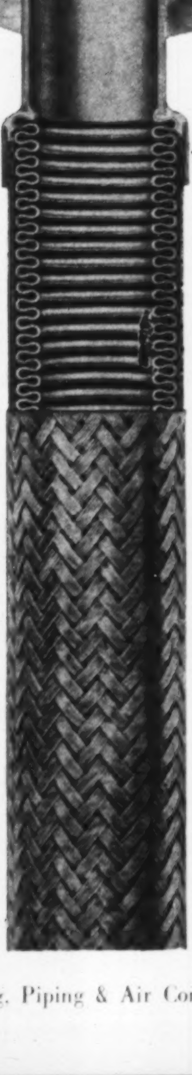
AMERICAN

VIBRATION ELIMINATORS

INSTALLATION INSTRUCTIONS - AMERICAN VIBRATION ELIMINATORS
IMPORTANT: READ BEFORE INSTALLING

2

Installed clean, bright and dry. The tough, water tight, polyethylene envelope preserves the factory built-in quality. When you're ready to install, the envelope is easy to remove, the Vibration Eliminator comes out bright, clean, and dry. Simplified installation instructions in each box make your job easier.



1

Lasting, leakproof performance engineered and built-in at the factory. The core is seamless, corrugated tin-bronze tubing, quality controlled through every manufacturing stage. This copper-tin alloy is specially engineered to stand up under vibration while carrying gases and liquids under pressure. Because the core is *seamless,* there are no joints or laps where leaks can start.

For extra strength and durability, the core is covered with bronze wire braid securely brazed in place. Sizes through 2" have a single wire braid covering, larger sizes a double braid covering for added strength.

Before it's shipped, the final assembly is pressure tested, oven dried, and sealed in a plastic envelope to keep out dirt and moisture.

3 **You know what you get** when you insist on "American Vibration Eliminators" marked on the carton and "American" stamped on the ferrule of the assembly. To get quality—look for "American."

American Vibration Eliminators are sold by leading distributors everywhere. For descriptive folder of standard sizes with installation instructions, write to The American Brass Co., American Metal Hose Division, Waterbury 20, Conn. In Canada: The Canadian Fairbanks-Morse Company, Ltd.

55191

WHEREVER CONNECTORS MUST MOVE
AMERICAN
Vibration Eliminator
THE AMERICAN BRASS COMPANY · AMERICAN METAL HOSE BRANCH WATERBURY 20 CONN
an ANACONDA product

FOR AMERICAN VIBRATION ELIMINATORS SEE YOUR

ANACONDA

DISTRIBUTOR

Random Thoughts from a Filter Engineer

by William B. Watterson

SALES ENGINEERING DEPT.

- **OUR COMPETITORS MAKE GOOD AIR FILTERS**
- **WHY NOT SEALED BIDS?**
- **"DE-HUMBUGGING" THE ADS**

OUR COMPETITORS MAKE GOOD AIR FILTERS

It may seem unusual to tip our hat to competitors, especially in print. But honesty compels us to state that when you buy air filters from *any* reliable manufacturer you buy a product that well serves its intended purpose.

There are few, if any, secrets left in the air filter business. The accepted principles of removing air-borne dirt by straining, impinging, centrifuging or precipitation have been known before the turn of the century.

Perhaps the most important factor in buying filters is to select the right type for the job. That's where a manufacturer with long experience and a wide range of filter *types* can offer you something extra. When you bring your air filtration problem to him, the odds are more in your favor that the solution will be correct.

Air-Maze is one of the places where such a combination exists—more than 30 years experience in making almost every known type of air filter. We invite your consideration.

WHY NOT SEALED BIDS?

We see where a sub-contractor recently sued the general contractor because he used the sub-contractor's bid to get the job, then started to shop around for a better price. The court upheld the plaintiff and awarded him the profit he would have made, compensating for his work in preparing his estimate.

Preparing specifications on a job costs money and time. No one objects if the job is finally awarded at a fair price. But often, the contractor "shops around" and the eventual winner finds only a shallow victory in the form of a no-profit price.

We believe in competitive bidding. It's the American way and it generally results in lower costs. But how about limiting it to just one bid per competitor—a sealed bid? Can't the "going in and coming out price" and the resultant auction be eliminated?

"DE-HUMBUGGING" THE ADS

Some of our contemporaries are claiming strange virtues for all-metal filter panels. One says "no oil is required at all". And another puts it this way, "heavy, messy oils are prohibited".

It's true that any metal filter (even those we make) can be operated dry, or nearly so. The trouble is, they're not very efficient that way, particularly for fine dust. And what little is stopped temporarily, generally manages to dislodge and pass through the filter. Only after enough lint or bulky particles are collected on the face, do such filters do much filtering.

Let's face it. The viscous impingement filter *does* require servicing, but in return it holds more dirt than any other kind. If you duck the service problem by using the filter dry or almost dry, you defeat the very thing for which the filter was designed—that of stopping dirt.

If you really want a dry filter, there are several good ones on the market—including one we make—that use a truly strainer-type media. The Air-Maze Corporation, 25000 Miles Road, Cleveland 28, Ohio.

AIR-MAZE

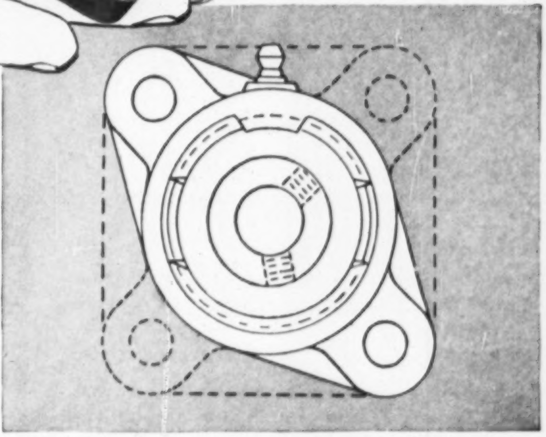
The Filter Engineers

AIR FILTERS • SILENCERS • SPARK ARRESTERS
LIQUID FILTERS • OIL SEPARATORS • GREASE FILTERS

NOW!
SAVE FASTENERS!
CLOSER BEARING SPACING!
SAVE INSTALLATION TIME!

SEALMASTER

cuts
corners
to save
DOLLARS
for you!



Check these facts!

- Cuts installation costs by eliminating two fasteners and punching or drilling operation required for two mounting holes.
- Permits closer bearing spacing on multiple shaft installations.
- As a replacement bearing unit fits the diagonal bolt centers on present four-bolt flange units.
- Carries the same load rating for a given shaft size as four bolt units.
- Retains all patented design features of SEALMASTER Bearing Units—Zone Hardening, Self-Alignment, Locking Pin & Perimeter Dimple and Labyrinth Seal.
- Available in shaft sizes from ½ to 2$\frac{3}{16}$ inches.

New SEALMASTER
2-BOLT FLANGE UNIT

Call your SEALMASTER Distributor or mail this coupon today!

Please send Bulletin SS-125 containing full information on the new SEALMASTER 2-Bolt Flange Ball Bearing Unit.

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BALL BEARING UNITS

SEALMASTER BEARINGS A DIVISION OF STEPHENS-ADAMSON MFG. CO. • 47 RIDGEWAY AVE., AURORA, ILLINOIS

NEW
BALTRIC MOTORS

Now, in a complete line of totally enclosed *streamcooled* motors, *Baltric* brings you the best answer yet to your motor problems. Less weight . . . less bulk . . . better performance, are the result of advanced engineering and new and better materials.

The new *Baltric Motors* pack much more power per ounce . . . permit applications and installations of greater versatility. Simple in design, rugged, yet compact and dependable, *Baltric* does a better job in less space than old-style motors. *Baltric* is a better bet for every use.

Original *Streamcooled* Motors Also Available—
Built to Old NEMA Standards

ALL *BALTRIC* MOTORS TOTALLY ENCLOSED
AND *STREAMCOOLED*

BE55-7

MORE VERSATILE

The smaller size and lighter weight of BALTRIC Motors has made possible applications and installations of much greater versatility. Any desirable positioning of the motor is now not only possible, but practical.

STREAMCOOLED BALTRIC MOTORS • TOTALLY ENCLOSED BALL BEARING • FAN COOLED

Capacitor Start, Induction Run, Single Phase Motors, 55°C Continuous Duty, 60 or 50 Cycle*, 115/230 Volts

H.P.	F. L. R.P.M.	NEMA No.	F. L. % Eff.	F. L. % P. F.	Torque Lbs. Ft.			Net Wt.
					F. L.	Break Down	Locked	
⅛	1140	48	48.5	57.0	0.57	1.60	2.35	21
1/6	1725	48	61.7	63.1	0.51	1.40	1.55	18
1/6	1140	48	44.5	57.3	0.77	2.10	3.75	24
¼	1725	48	60.0	65.0	0.77	2.00	2.46	21
¼	1140	56	52.5	62.0	1.15	2.58	3.30	32
⅓	1725	48	64.5	67.0	1.00	2.56	3.45	24
⅓	1725	56	67.3	68.0	1.00	2.50	3.75	32
⅓	1140	56	56.2	60.5	1.53	3.72	4.90	36
½	3450	56	73.7	76.0	0.77	1.62	1.85	32
½	1725	56	69.5	68.6	1.53	3.82	4.13	36
½	1140	56	62.6	64.7	2.29	5.45	6.10	39
¾	3450	56	74.0	84.0	1.15	2.74	3.12	36
¾	1725	56	73.6	73.0	2.29	4.88	7.80	39
¾	1140	184	71.5	68.0	3.44	7.10	9.80	67
1	3450	56	74.6	83.6	1.53	2.38	3.50	39
1	1725	182	79.8	75.0	3.05	6.70	6.40	49
1.5	3450	182	77.2	85.0	2.29	5.60	4.90	49
1.5	1725	184	78.0	74.0	4.57	10.00	11.00	67
2	3450	184	77.0	90.0	3.06	6.90	5.90	67

Squirrel Cage Induction Motors, Normal Torque, NEMA Design B, Across the Line Starting, 50°C Continuous Duty, 60 or 50 Cycle* 110/220, 208, 220/440 or 550 Volts, 3 or 2 Phase

H.P.	F. L. R.P.M.	NEMA No.	F. L. % Eff.	F. L. % P. F.	Torque Lbs. Ft.			Net Wt.
					F. L.	Break Down	Locked	
¼	3450	48						18
¼	1725	48						18
¼	1140	56	69.0	67.3	1.14	3.95	3.34	25
¼	850	56						29
⅓	3450	48						18
⅓	1725	48			1.02			21
⅓	1725	56	78.2	72.1	1.02	3.54	2.59	25
⅓	1140	56	71.8	65.0	1.52	5.37	4.56	25
⅓	850	56						34
½	3450	48						21
½	1725	48						24
½	1725	56	73.6	73.8	1.51	5.13	4.23	26
½	1140	56	72.0	75.5	2.33	6.43	4.75	29
½	850	182						42
¾	3450	56	79.6	83.8	1.13	3.48	3.32	26
¾	1725	56	80.5	79.8	2.29	7.3	5.8	29
¾	1140	182	82.0	69.0	3.42	11.0	7.9	42
¾	850	184						46
1	3450	56	83.0	90.0	1.53	5.30	4.14	29
1	1725	56	82.4	85.7	3.05	9.15	7.63	34
1	1725	182	84.0	85.0	3.05	10.07	8.56	43
1	1140	184	83.5	70.8	4.56	14.4	9.15	46
1	850	213						98
1.5	3450	182	83.5	97.6	2.28	7.42	5.82	43
1.5	1725	184	87.6	84.0	4.56	14.90	11.20	46
1.5	1140	184	83.6	76.5	6.86	18.90	14.70	51
1.5	850	213						98
2	3450	184	86.0	94.8	3.05	8.40	7.33	46
2	1725	184	88.4	88.6	6.10	17.10	14.60	51
2	1140	213	82.5	79.0	9.12	26.90	18.24	98
2	850	215						110
3	3450	184						51
3	1725	184						60
3	1725	213	85.4	90.5	9.15	24.50	16.30	98
3	1140	215	83.1	84.1	13.70	36.55	25.20	110
5	3450	213						98
5	1725	215	89.0	89.9	15.15	39.80	28.30	110
7.5	3450	215						118

*Performance characteristics are for 60 cycle motors.

BALDOR ELECTRIC COMPANY

4353 DUNCAN AVENUE • ST. LOUIS 10, MISSOURI

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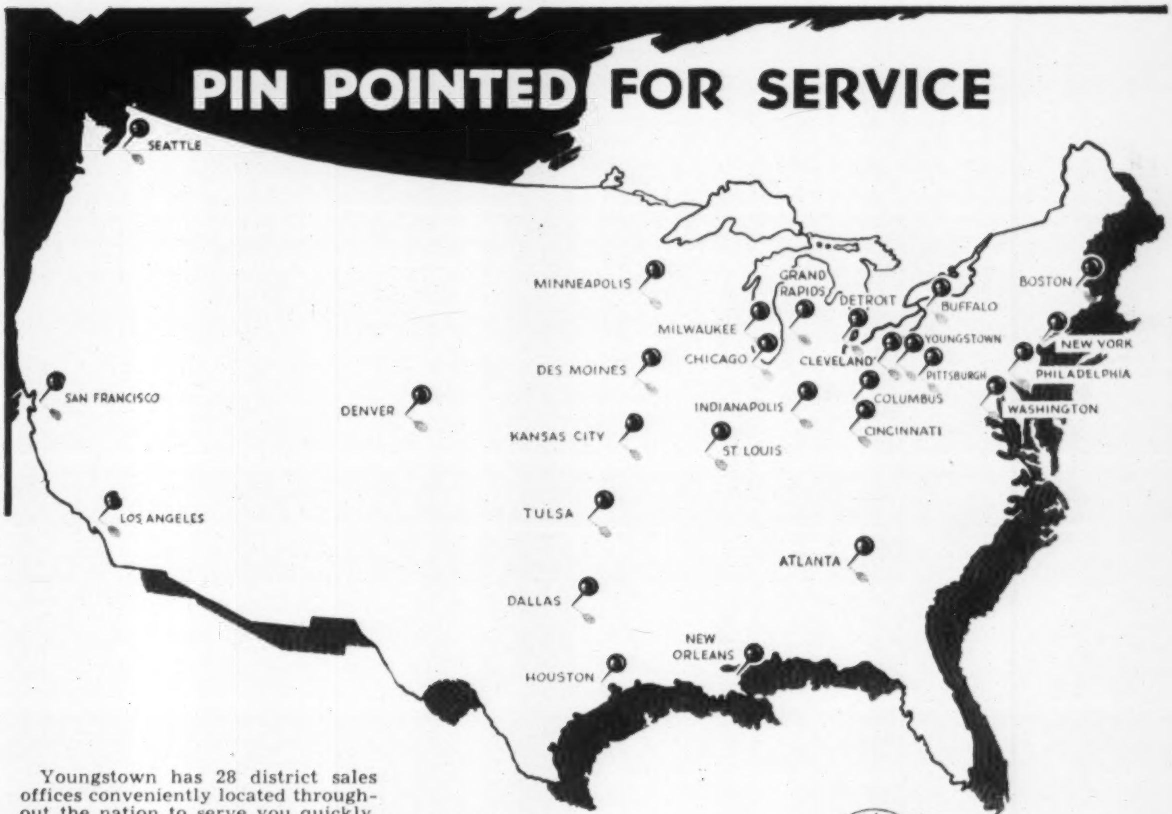
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Youngstown has 28 district sales offices conveniently located throughout the nation to serve you quickly. They are staffed with men who know the steel business thoroughly and are qualified to help you with your steel requirements. You can get quick service whether you write, wire or phone your nearby Youngstown District Sales Office.

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2400 Terminal Tower Bldg.
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THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Stambaugh Building - - Youngstown 1, Ohio
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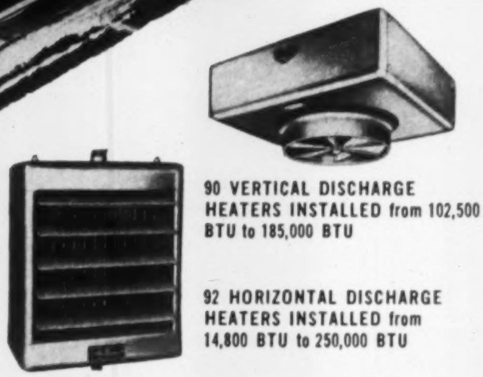
SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

National Biscuit Company
Chicago, Illinois

Architect: Alexander D. Crossett, New York, N. Y.
General Contractor: Ragnar Benson, Inc., Chicago, Ill.
Heating Contractor: Robert Gordon, Inc., Chicago, Ill.

NATIONAL BISCUIT COMPANY
NABISCO

Airtherm



90 VERTICAL DISCHARGE HEATERS INSTALLED from 102,500 BTU to 185,000 BTU

92 HORIZONTAL DISCHARGE HEATERS INSTALLED from 14,800 BTU to 250,000 BTU

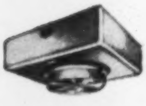
STEAM UNIT HEATERS

WARM THE WORLD'S LARGEST BAKERY

To achieve flexible, economical heating throughout Nabisco's new $20 million Chicago plant, 182 Airtherm steam unit heaters have been installed. The plant is the world's largest cracker and biscuit bakery with ovens the length of football fields, almost 20 acres of floor space and a capacity of 167 million pounds yearly.

When the area to be heated presents unusual problems, chances are you can solve them easily and economically with the flexibility of Airtherm unit heaters.

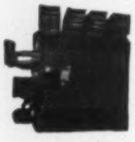
Convectors



Vertical Steam Unit Heaters

Horizontal Steam Unit Heaters

Centrifugal Fan Type Unit Heaters



Direct Fired Space Heaters

Gas Fired Unit Heaters

FOR HEATING SATISFACTION . . . THINK FIRST OF

Airtherm

MANUFACTURING COMPANY
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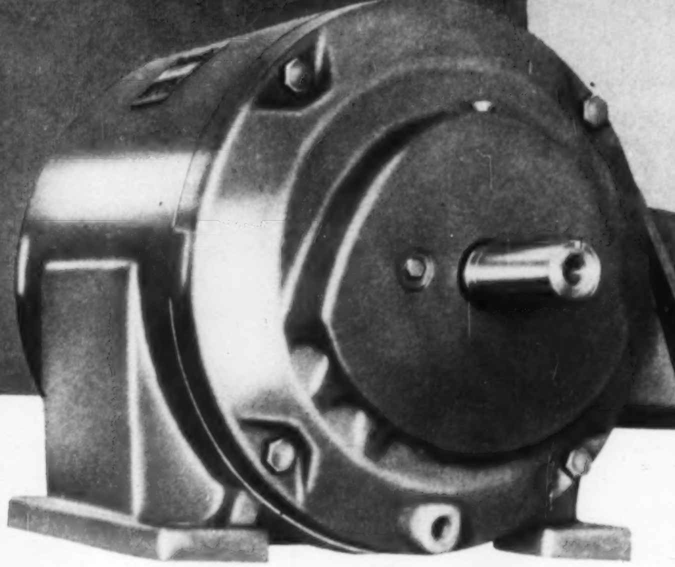
Totally Protected



FROM CORE TO COVER

RELIANCE
Totally-Protected
MOTORS

The total protection concept of design and construction armors Reliance A-c. Motors against everyday hazards, with little or no maintenance. Total protection is made up of extra features like:

- Slot cell insulation of Double Backed Mylar
- Dynamically balanced rotor for vibrationless operation
- Entire insulation system impervious to acids, moisture and oils
- Metering plate regulates grease flow to bearing
- Ventilation louvres positioned high and dry in end brackets

There are 100 of these extra core to cover protection features in Reliance Motors. Each point is covered in our bulletin, "Check the 100 Facts". Why don't you write for one and get all the details? B-1510

RELIANCE ELECTRIC AND ENGINEERING CO.

Cleveland 10, Ohio • Offices in Principal Cities
Canadian Division: Welland, Ontario

How Bethcon helps you do better sheet-metal work

Here we see part of the complex heating and ventilating system of a large department store in New Jersey. Tons of Bethcon galvanized sheets went into the fabrication of this system and contributed substantially to the quality of the installation.

You can do better sheet-metal work with Bethcon because Bethcon sheets are made by a continuous process of galvanizing, which binds the zinc coating more tightly to the steel than the conventional method. This extra-tight coating permits severe forming without danger of cracking or flaking off.

You will find, in addition, that Bethcon has brighter, more uniform spangles which present a more attractive appearance. And the zinc is distributed more uniformly over the entire sheet, thus eliminating the bead normally found on the drip end.

If you have not yet worked with Bethcon galvanized sheets a chat with someone who has should prove interesting to you. We will be glad to give you the name of such a contractor in your vicinity. And, of course, we are ready at any time to discuss Bethcon with you ourselves. Just call or write to the nearest Bethlehem sales office.

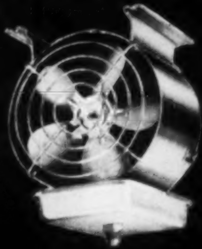
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. ***Export Distributor:*** **Bethlehem Steel Export Corporation**

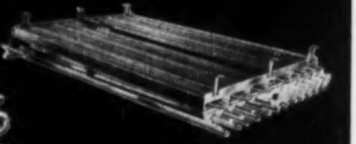
BETHLEHEM STEEL

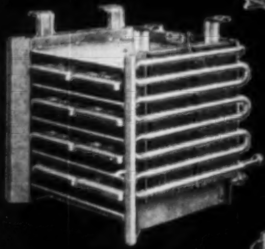
BETHLEHEM STEEL

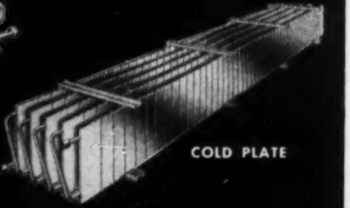
THE COMPLETE PEERLESS LINE FAMOUS FOR BUILT-IN SATISFACTION

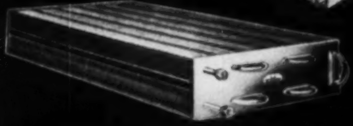

PIE PLATE COIL

DRIP PUMP


FLASH COOLER


CUBE MAKER


COLD PLATE

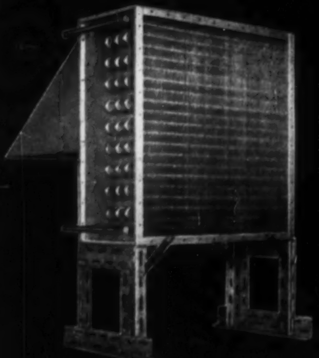

WALK-IN COOLER FIN COIL

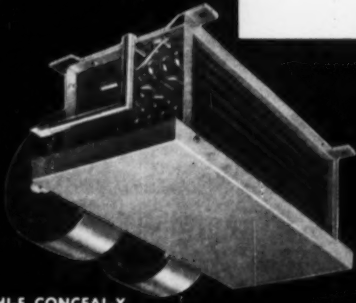
In Peerless you not only satisfy your customers' needs in coils, but you also give the extra advantages found only in Peerless Products, the result of 43 years experience in manufacturing coils of all types and exclusive features of design and construction. These features mean continuous satisfaction year after year because of a constant B. T. U. capacity rate.

The manufacturer or contractor who specifies and uses Peerless builds business on the firm foundation of customer satisfaction. At no other time in history has industry shown such a marked preference for Peerless air conditioning and refrigeration coils.

May we have the privilege of sending you catalogs and price lists?

MANUFACTURERS NOTE: *Send us blueprints of your evaporator and condenser requirements for quotation. Please indicate delivery requirements.*


HI-F AIR COOLED CONDENSER


HI-F CONCEAL-X
AIR CONDITIONING UNIT

FIN COIL

HI-F
AIR CONDITIONING
COIL

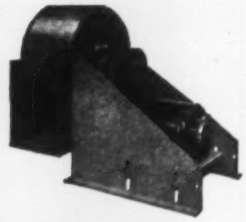
PEERLESS
PEERLESS AMERICA CHICAGO

PEERLESS OF AMERICA, INC.

MANUFACTURERS OF REFRIGERATION AND AIR CONDITIONING COILS SINCE 1912

Dept. H, 5830 N. PULASKI ROAD, CHICAGO 30, ILL., U.S.A.

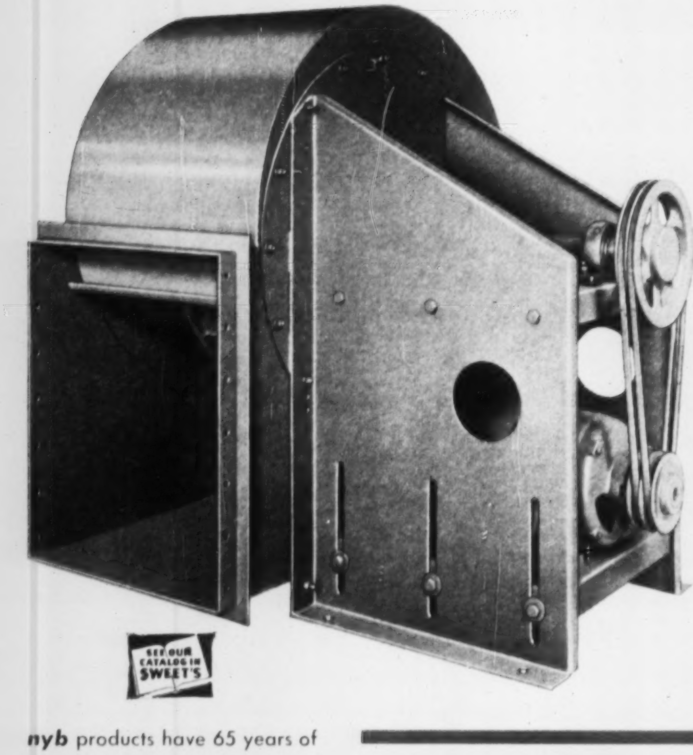
nyb



Nos. 76 and 91
Belted
Junior Fan

GENERAL PURPOSE FANS

Recommended for their ease of installation, low maintenance cost and space saving features.



SEE OUR CATALOG IN SWEET'S

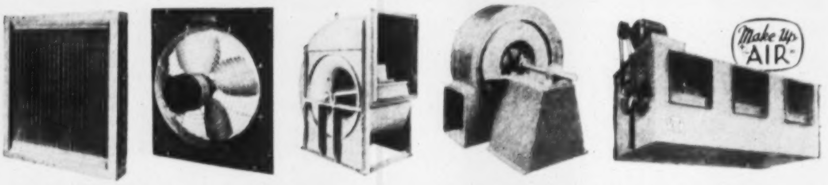
Portable, self-contained units of medium capacities for low pressure industrial and ventilating applications. Designed particularly for use with duct systems.

General Purpose Fans are made in three types and eight basic sizes with capacities from 1200 to 19,000 cfm. (Junior fans in five sizes from 160 to 4100 cfm). These include both direct connected and belt driven models.

No. 10 G. I.
Industrial Fan

with manganese bronze wheel, spark proof and acid resistant. For use in hazardous locations where explosive air mixtures are to be handled, and for handling hot gases and conveying materials in process. Two arrangements, two types of wheels. All fans reversible. Speeds up to 4500 rpm. For temperatures up to 350°.

nyb products have 65 years of manufacturing experience and engineering knowledge built into them. All ***nyb*** products are laboratory tested, accurately rated and fully guaranteed in strict accordance with standard test codes.



When working on your air handling problems, consult the *nyb* representative nearest you in our nationwide service or write for bulletins.

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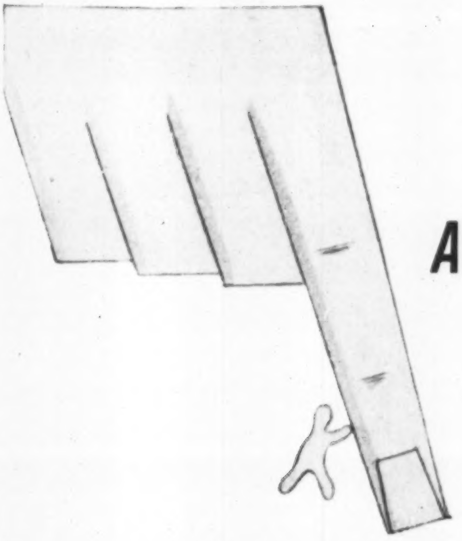
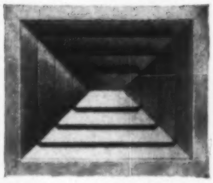


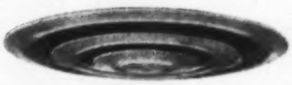
Put your finger on correct *AIR HANDLING* Equipment

AGITAIR®

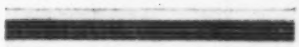
for better air



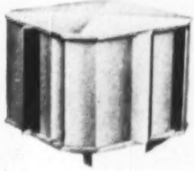
Square, Rectangular and Continuous Diffusers



Circular Adjustable and Non-Adjustable Diffusers



Stripline Sectional and Continuous Diffusers



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High Velocity Air Filters

From drawing board to finished product, every AGITAIR is designed and built to provide dependable operation, maximum efficiency, minimum maintenance and years of continuous carefree service. And where AGITAIR engineering ends... AGITAIR technical service begins... to help you select the proper shapes and sizes to meet your particular requirements.

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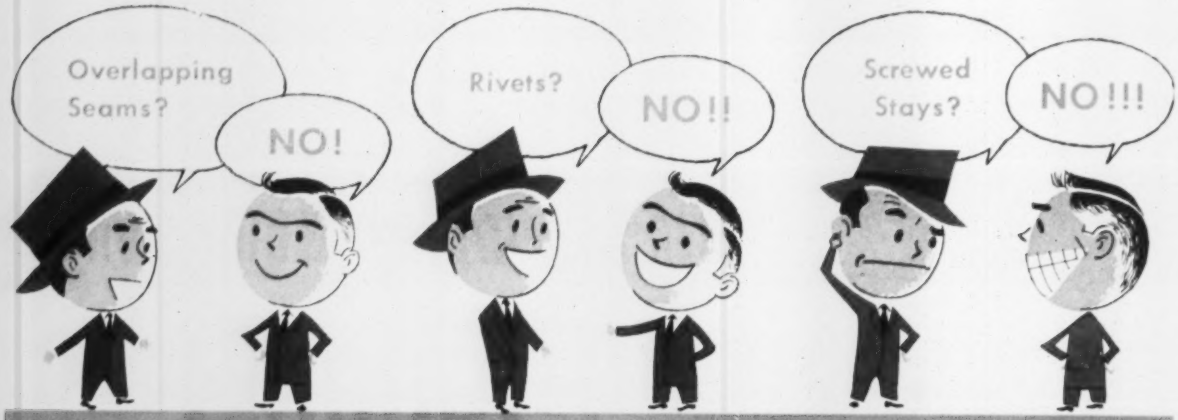
AIR DIFFUSERS • FILTERS • EXHAUSTERS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Rivets?
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You get leakproof dependable performance with the

All-Welded All-Around

TITUSVILLE Type WP

FIREBOX BOILER

Twelve sizes to cover service requirements from 25 H.P. to 304 H.P.

Yes sir, you can dismiss leak worries with the Titusville WP—this precision-formed, fusion-welded boiler remains tight under all operating conditions, and is the satisfying answer to your demand for high efficiency and low maintenance at sensible cost. Ask for latest Bulletin B-3030.

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THE TITUSVILLE IRON WORKS COMPANY
TITUSVILLE, PENNSYLVANIA

A division of Struthers Wells

***Manufacturers** of A Complete Line of Boilers for Every Heating and Power Requirement*

This pump puts maintenance men on the shelf

The maintenance man who depends on repairing Dunham Vacuum Heating Pumps for his living . . . can quit right now. There's nothing for him to do.

Dunham Code Rated Pumps just don't *require* extensive maintenance—even after 15-20 years of continuous service producing high vacuum (26 in., if required) at low amperage. Here's why:

Dunham Pumps need no close clearance adjustment to maintain capacity . . . no extra-high air capacities to compensate for lower efficiency due to pump wear.

Dunham Pumps have *only one* principal moving part.

Dunham Pumps need *only one* motor for removal of *both* air and condensate.

Dunham Pumps have no vacuum on pump stuffing box.

Dunham Pumps are code rated—your assurance of more than adequate air capacity, without overrating to compensate for leaky systems.

Dunham Pumps have heavy-gauge copper bearing steel tanks for maximum resistance to corrosion.

Single and duplex models in capacities from 2500 through 65,000 EDR. For full information, mail coupon.

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- CEMENT
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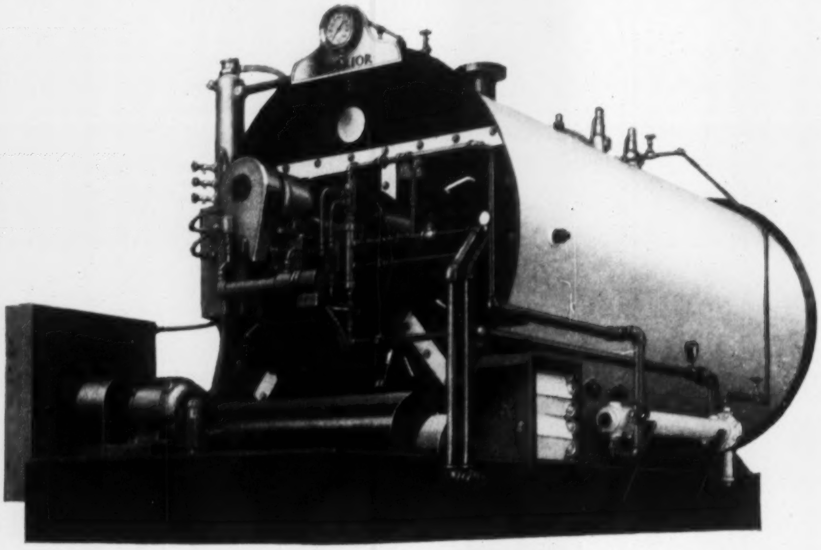
STEAM at the POINT OF USE

cuts costs for process industries

To provide high quality process steam for widely separated operations, many processing plants are installing completely packaged Superior Steam Generators at, or close to the point where steam is used. These highly efficient and compact units may be set up on any floor capable of supporting their weight, connected to service supply and fuel lines, and put into operation within 24 hours of delivery.



Put a *PACKAGED PLANT* in your picture

18 sizes from 20 to 600 b.h.p. and for pressures to 250 p.s.i. For complete details write today for Catalog 804

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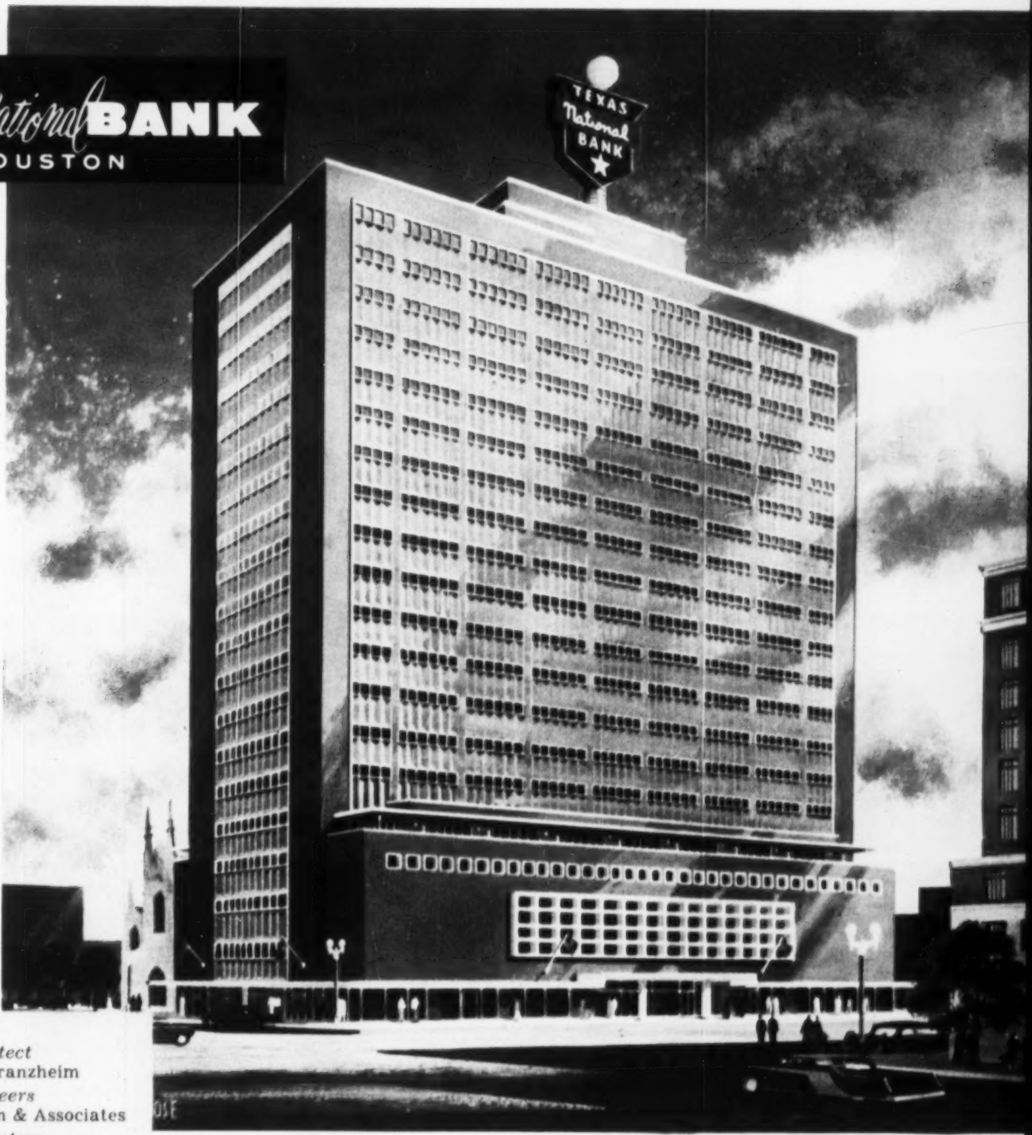

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POWERS

System of individual room
Air conditioning control
used in this colorful building

The ultimate in comfort has been provided for the occupants of this beautiful building. With individual room control they can select and enjoy the temperature they want.

Maximum year-round comfort, obtained with 640 Powers pneumatic summer-winter thermostats controlling 1500 air conditioning units, helps increase employee efficiency.

When you want modern individual space temperature control specify a Powers pneumatic system. The advantages of its simplicity and dependable performance have been *proven* in many of the nation's prominent buildings.

THE POWERS REGULATOR COMPANY

Skokie, Illinois | Offices in Chief Cities in U.S.A., Canada and Mexico

65 Years of Automatic Temperature and Humidity Control

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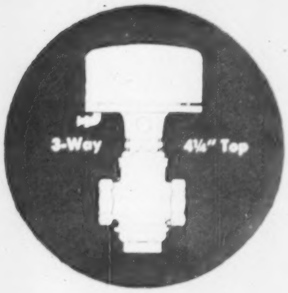
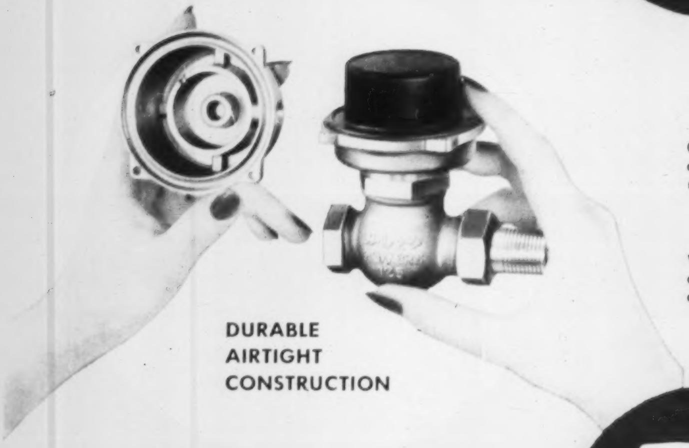
POWERS

First with duo-seal PACKLESS CONTROL VALVES



Screwed Ends

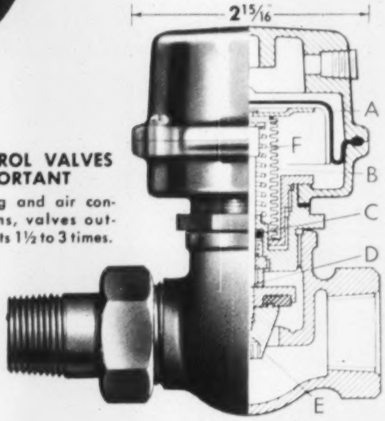


DURABLE
AIRTIGHT
CONSTRUCTION

GOOD CONTROL VALVES ARE IMPORTANT

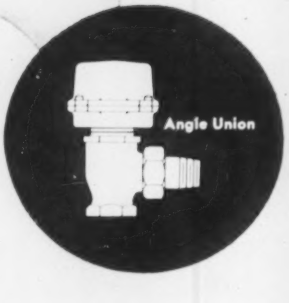
On many heating and air conditioning systems, valves outnumber thermostats 1½ to 3 times.

Various Types and Sizes for all Requirements



Rugged Cast Aluminum Top

- A) Durable Molded Diaphragm
- B) Bronze Bellows, Primary Seal
- C) "O" Ring, Secondary Seal
- D) Ground and Polished Monel Stem
- E) Characterized Throttling Nut
- F) Inconel Compression Spring



More ACCURATE Control with Powers PACKLESS Valves

Minimum valve stem friction. No packing nut or gland to be tightened, oiled or adjusted. No binding of valve stem as with conventional packing. Powers **duo-seal construction** assures better performance and—

Reverse Flow Double Union

No Packing Maintenance. No Leakage of Water or Steam. No Loss of Vacuum.

To insure getting a temperature control system with the best control valves made for convectors, unit air conditioners, unit ventilators, radiators, panel heating and cooling coils — specify or install POWERS control.

Call or write our nearest office for Bulletin 348

Established in 1891 • THE POWERS REGULATOR COMPANY • SKOKIE, ILL. • Offices in Over 60 Cities

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KENNARD Engineered
COOLING COILS
HEATING COILS
AIR CONDITIONING BLOWER UNITS
MULTI-ZONE AIR CONDITIONING UNITS
HEATING AND VENTILATING BLOWER UNITS
HEATING HUMIDIFYING VENTILATING
SPRAYED COIL DEHUMIDIFIERS
LIQUID CHILLERS
KENNARD QT
WATER SAVERS
COOLING TOWERS
EVAPORATIVE CONDENSERS
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KENNARD *Engineered*

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Manufacturers of quality air conditioning equipment for discriminating contractors, consulting engineers and architects.

- ○ COOLING COILS
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- ○ EVAPORATIVE CONDENSERS

Write for such bulletins or catalogs as you need.

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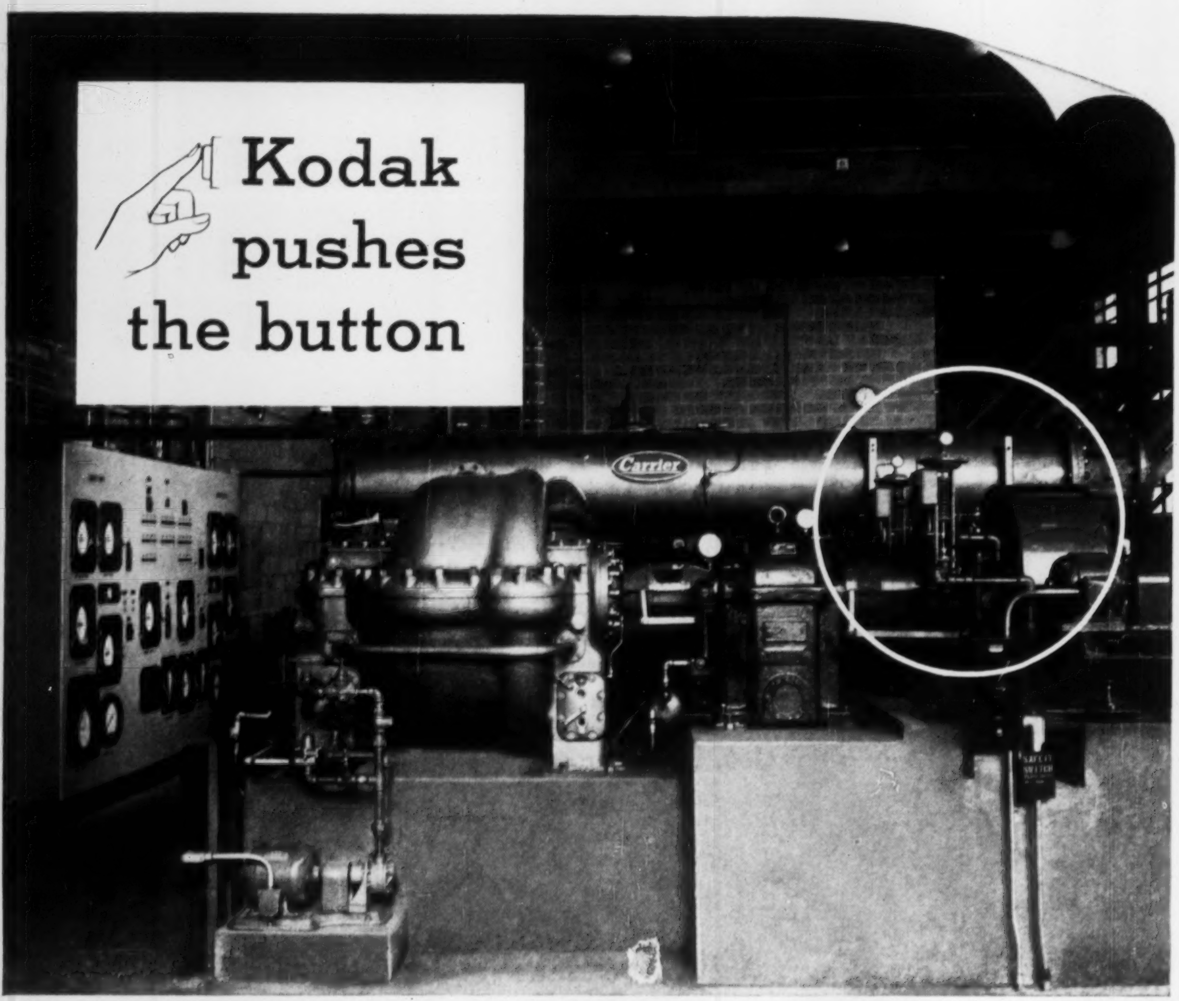
1817 HANLEY RD. • ST. LOUIS 17, MO.

Representatives in all principal cities

Kodak pushes the button



We do the rest...

In controlling the refrigeration system at Kodak's huge new distribution Center at Rochester, N. Y.

This center handles practically every Rochester-manufactured Kodak product for storage, packing and shipping in its 476,000 square feet of floor space.

Air conditioning for storage of sensitive photographic films and papers is extremely important, and it starts off right with these 250-ton Carrier centrifugal compressors which supply the chilled brine to the Taylor controlled temperature zones . . . "the most fully automatic compressors we ever installed", say Carrier engineers about these Taylor controlled centrifugals.

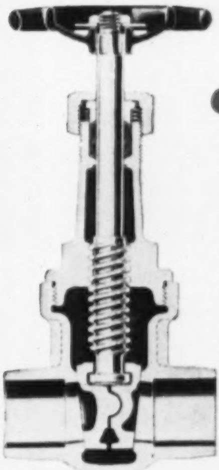
Taylor controls keep the output temperature of the chilled brine constant by regulating the oil volume in the hydraulic coupler (circled) between the compressor itself and a constant speed motor. During periods of minimum load, an ingenious hot gas by-pass induces a load on the compressors to eliminate surging and keep the system fully automatic. From Friday night to Monday morning, when the load is especially light, the system automatically keeps the brine temperature constant with *no manual attention whatever.*

No matter what your air conditioning or refrigeration problem may be, you'll get most efficient operation from your equipment when it's under Taylor Control. Ask your Taylor Field Engineer, or write for **Catalog 300.** Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

NEW
LUNKENHEIMER
SOLDER-END
VALVES
for COPPER TUBING

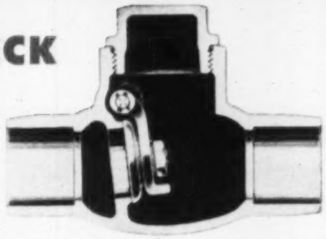


GATE
FIG. 2131
½" to 2"
125 lb. S.P.
200 lb. W.O.G.
Rising Stem
Double Wedge Disc

FIG. 2132
Solid Wedge Disc

FIG. 2133
Non-Rising Stem
Single Wedge Disc

SWING CHECK
FIG. 2145
½" to 2"
125 lb. S.P. 200 lb. W.O.G.
Renewable
Bronze Disc and Side Plugs



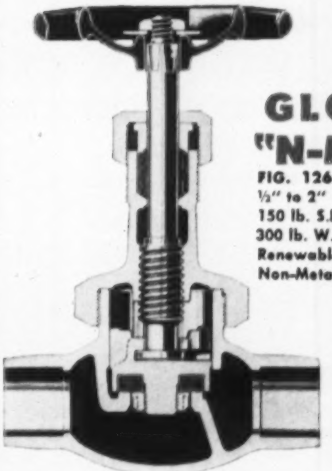
Easier, tighter installation! Lasting, trouble-free service!

Now you can take advantage of the superior quality, advanced design, and outstanding performance of famous Lunkenheimer Bronze Valves for your copper tubing installations!

The complete line of five patterns, with precision machined bores and ends, is designed for use with types K, L, and M copper tubing.

In operating features, materials, and workmanship, these valves are identical with the corresponding Lunkenheimer figures in the Screwed-End Bronze Valve series:

- *Non-Slip Handwheel assures tight closing*
- *Famous Stemalloy Stem—millions in use, without a single failure*
- *Hexagon Head Gland for easier repacking*
- *Extra-deep Stuffing Box reduces servicing*
- *Repacking Seats above stem threads*
- *Body and Bonnet of dense, close-grained, corrosion-resistant bronze*



GLOBE "N-M-D"
FIG. 126
½" to 2"
150 lb. S.P.
300 lb. W.O.G.
Renewable
Non-Metallic Disc

LUNKENHEIMER
QUALITY

FOR COMPLETE DETAILS ON THE NEWEST AND BEST SOLDER-END VALVES see your Lunkenheimer Distributor or request literature from The Lunkenheimer Company, Box 360, Cincinnati 14, Ohio.

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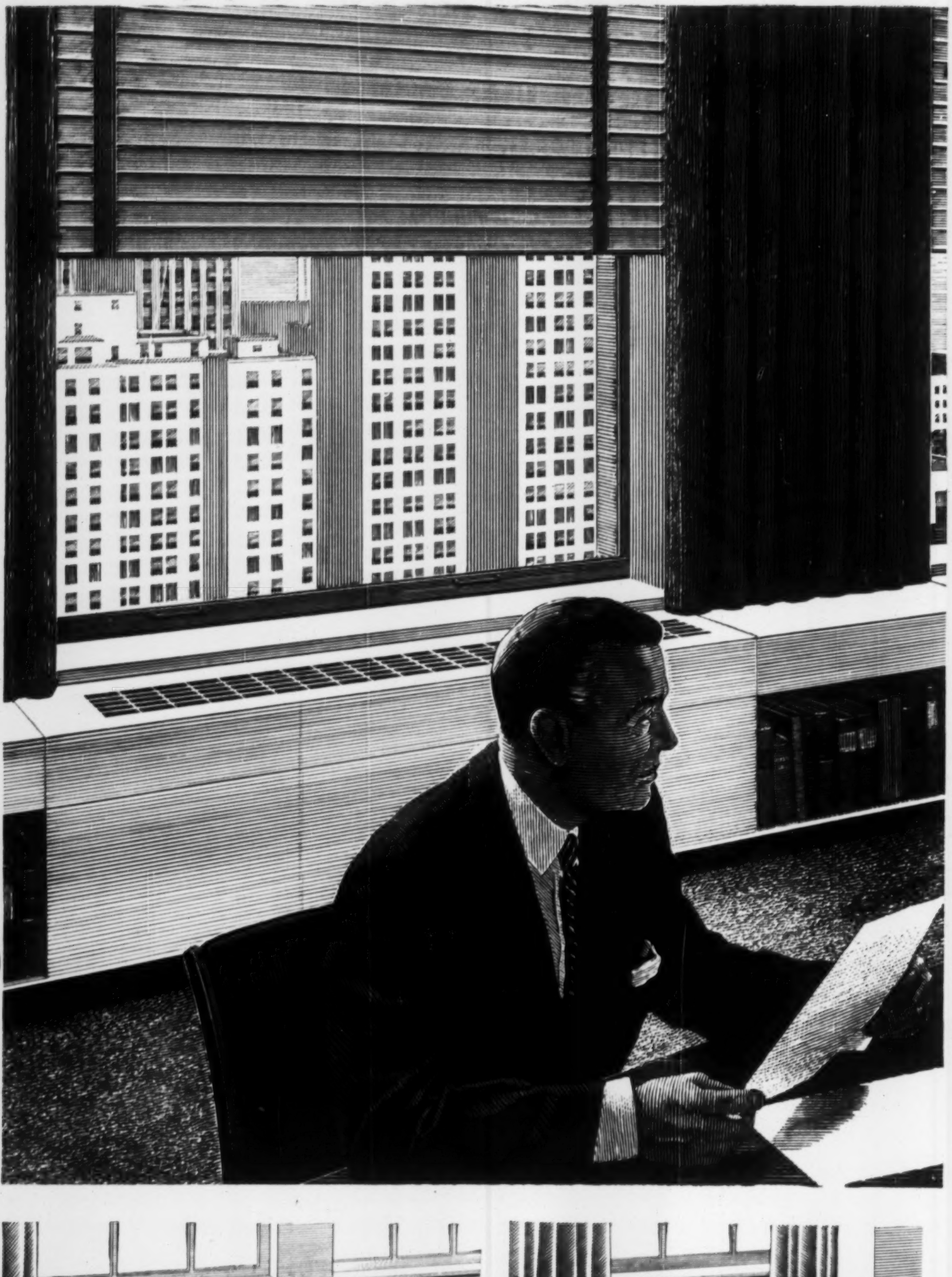
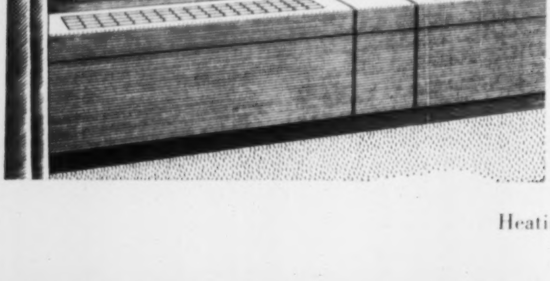
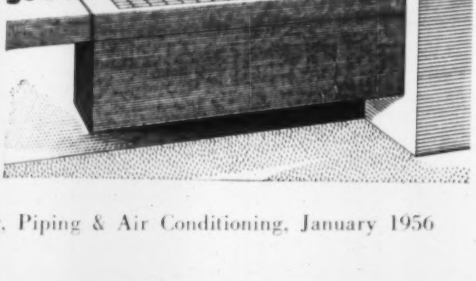
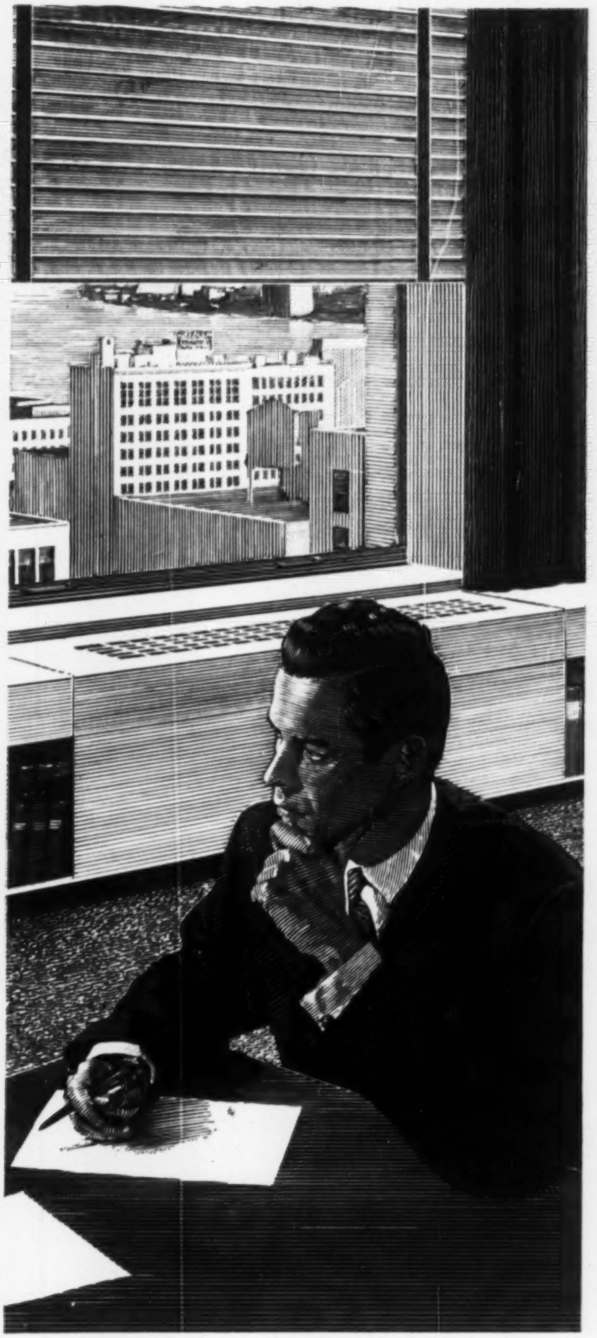
BRONZE • IRON • STEEL • PVC
LUNKENHEIMER®
THE ONE *Great* NAME IN VALVES

Carrier again makes news









Office Air Conditioning Goes Modular!

Handsome new Weathermaster units fit any window or wall treatment—are assembled from standard "building blocks"

Now the world's finest air conditioning system—the Carrier Weathermaster* System—gets the world's most flexible and adaptable under-the-window units. New Modular Weathermaster units are based on the "building-block" idea. Standard components can be assembled into units that fit any size or shape space you may plan. The units actually become part of the architecture in any multi-story, multi-room building—old or new.

THEY'RE MODULAR! If you are modernizing an older building with traditional windows, you can plan for the units to hang on the wall, up above the baseboard. If you are designing new buildings with low windows, units can hug the floor—as little as a foot high. If your plan requires it, these units can be extended from wall to wall or column to column—or be confined to the wall space right under the window.

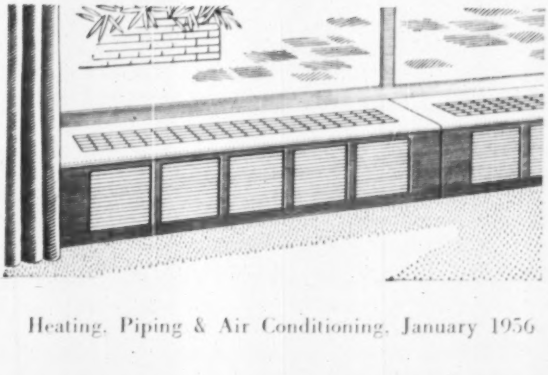
THEY'RE MODULAR! You can plan the units so that they become part of the wall. You can make them look like a decorative ledge . . . or built-in cabinets . . . or modern bookcases. There's no "tacked-on" look. And the pieces are so easy to assemble that you can install them in record time.

THEY'RE MODULAR! With Weathermaster units, you can save on ductwork. You can use fewer vertical risers, because the air supply can be extended through handsome prefabricated enclosures to units in series. And you have greater freedom in location—for lines can enter at the bottom of the unit or either side.

THEY'RE MODULAR!—plus all the famous Carrier Weathermaster advantages. A twist of the dial on the unit in each room brings the exact climate you want, any time of the day, any day of the year. Operation is quick, quiet, automatic, dependable.

Why not learn *all* of the reasons why the new Carrier Weathermaster units fit *any* plan? Find out how they give you unlimited flexibility in design. Call the nearest Carrier office or write for the big new colorful booklet that will help you picture handsome Modular Weathermaster units in the buildings you are planning. Carrier Corporation, Syracuse, New York.

*Reg. U. S. Pat. Off.



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air conditioning • refrigeration • industrial heating

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gas fired Conversion burners

Your customers will like the economy and efficiency of a JZ Gas Conversion Burner that eliminates coal storage and handling.

JZ Gas Fired Conversion Burner is fully automatic with a choice of electric or gas-actuated controls.

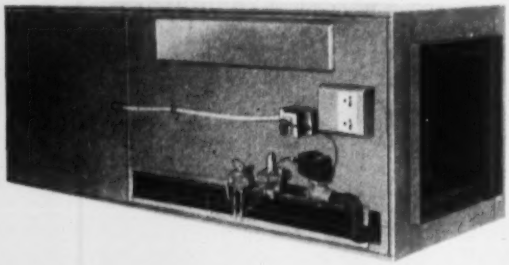
Installation — it is easy to make a workman like job — just bricks in ash pit opening of furnace — and it will fit 98% of the domestic heating plants. Gas Control Valves, pilot and piping are all shipped in a complete package assembly.

One Model #CB-200, on natural gas has input rating of 75,000 to 200,000 Btu. Pipe size ¾". A.G.A. approved.

Central gas heaters

VERTICAL OR HORIZONTAL

Central Heating Units that are universally adaptable; a complete package unit ready for installation. Vertical and Horizontal models of equal efficiency permit installation in basement, attic, service closet or utility room in old or new homes.



The Horizontal model can even be installed under the house, or for industrial heating can be installed on shelf or balcony; used as a suspended heater or as a duct heater.

Capacities from 65,000 Btu/hr input on natural, mixed or L.P. gas. A.G.A. approved.

Write for illustrated literature and prices.

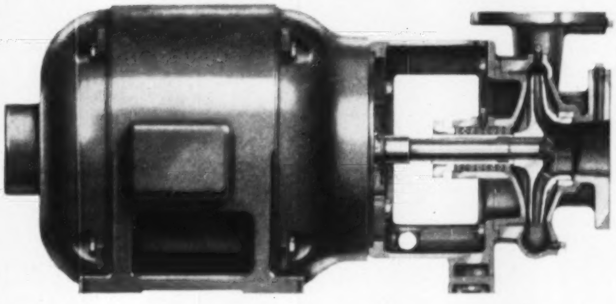
JOHN ZINK COMPANY
4401 S. PEORIA TULSA, OKLA.

Dependable performers

McDONALD

Close-Coupled Centrifugal Pumps

Ideally suited for air conditioning applications



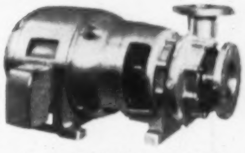
Sectional view of McDonald Figure 7520 Centrifugal Pump, illustrating sturdy construction.

The following McDonald features assure durability and top performance.

- Pump mounted directly on motor frame, impeller on motor shaft, assure correct alignment.
- All McDonald centrifugals fully bronze fitted—impellers, case rings, shaft sleeves and glands of durable bronze.
- Volute of rugged design for correct hydraulic relation to establish high efficiency performance.

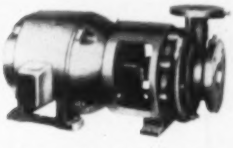
McDonald close-coupled centrifugals eliminate expensive foundations and require minimum space. N.E.M.A. close-coupled centrifugal pump motors are used.

Insure dependability, trouble-free performance by specifying McDonald close-coupled centrifugal pumps. Write for bulletins and prices.



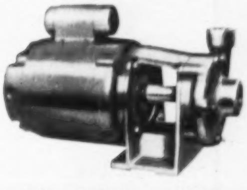
McDonald Figure 7520

High head centrifugal pumps, capacities to 950 G.P.M. Ideal operating range, 280 feet down to 150 feet T.D.H. Sizes 1½" to 4" discharge; motors 2 to 60 H.P.



McDonald Figure 7620

Moderate head centrifugal pumps, capacities to 280 G.P.M. Ideal operating range, 150 feet down to 50 feet T.D.H. Sizes 1¼", 1½" and 2" discharge; motors 1 to 10 H.P.



McDonald Figure 7720

Fractional horsepower centrifugal pumps, capacities to 70 G.P.M. Total heads, 20 to 85 feet. Sizes ¾" discharge with ¼ or ⅓ H.P. motors; 1" discharge with ½, ¾ or 1 H.P. motors.

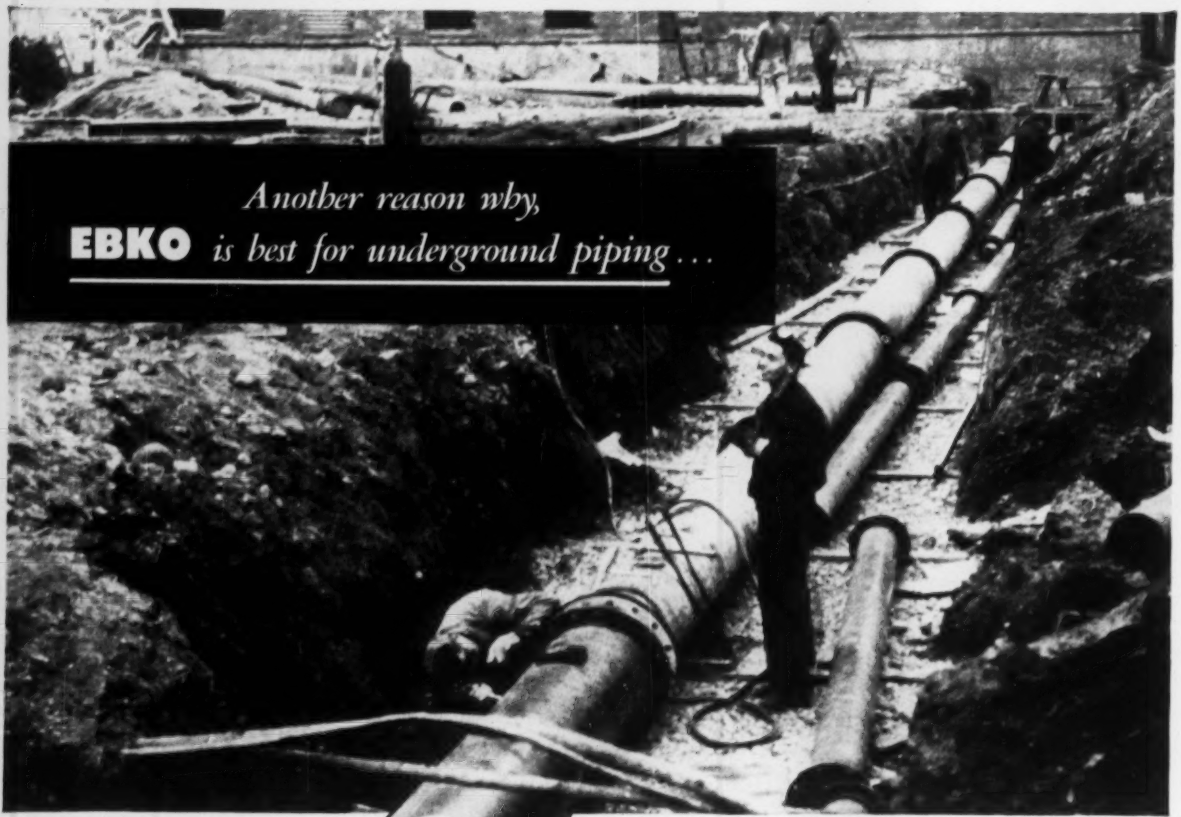
McDonald Belt Driven Units

All McDonald close-coupled centrifugal pumps available on frames for belt drive or direct connection with flexible coupling.

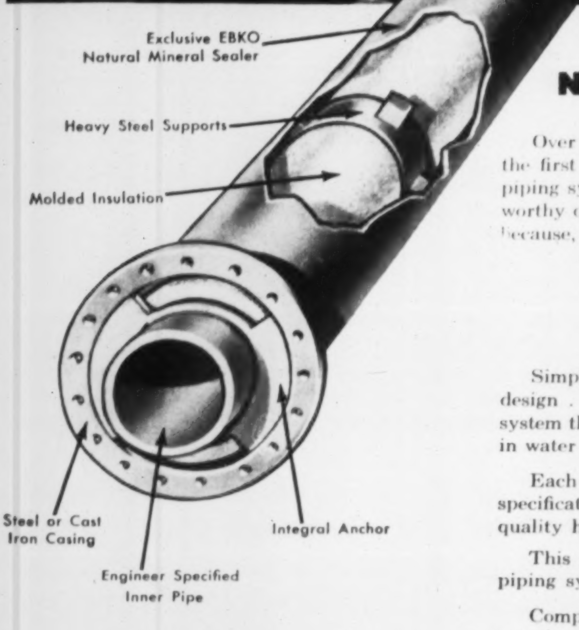
100TH ANNIVERSARY
1856-1956
McDonald
YESTERDAY-TODAY-TOMORROW

A. Y. McDONALD MFG. CO.
Dubuque, Iowa
PUMPS • BRASS GOODS
OIL EQUIPMENT

EST 1856
McDonald



Another reason why,
EBKO *is best for underground piping . . .*


Exclusive EBKO Natural Mineral Sealer
Heavy Steel Supports
Molded Insulation
Steel or Cast Iron Casing
Integral Anchor
Engineer Specified Inner Pipe

Never has an EBKO System Failed!

Over 1,000 miles of EBKO piping has gone underground since the first system was installed. The durability of this prefabricated piping system has been tested by these installations and has proven worthy of full investigation prior to the purchase of any system . . . because, never, to our knowledge, has an EBKO system failed.

What Is This Reason
For The Superior Durability
Of An EBKO System?

Simplicity . . . high quality component parts . . . improved design . . . inherent strength . . . and other factors add up to a system that is safe for any type soil. It can be completely submerged in water without deterioration for many, many years.

Each of the six component parts are held to the most rigid specifications. The simplicity of design allows EBKO to keep the quality high and yet keep the cost down.

This system costs no more initially than other prefabricated piping systems and saves money on installation and maintenance.

Complete details on this system may be had from local EBKO representatives or by writing to the factory—no obligation of course.

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Cast Iron
Steel

EBKO
Underground and Overhead
Prefabricated Piping Systems

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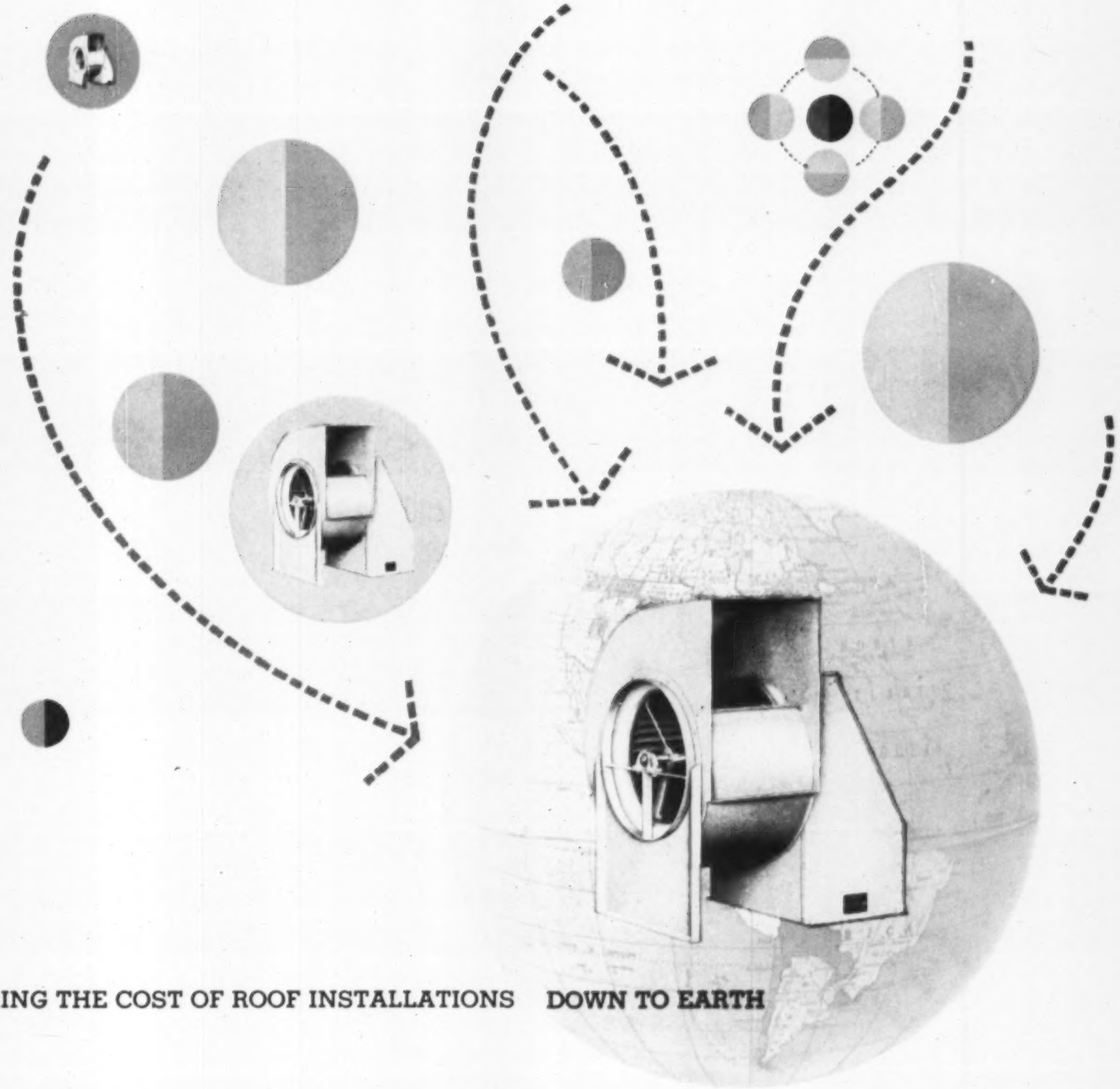
For STEAM • CONDENSATE • HIGH TEMPERATURE and CHILLED WATER • REFRIGERANTS • GASES • ETC.

**BRING THE COST OF ROOF INSTALLATIONS DOWN TO EARTH**

Utility's new blowers with weatherproof enclosures for motors and drives eliminate sky-high roof installation costs and weather-wear. These high-quality units insure a long life and a low amortized cost.

Because a roof installation becomes the "forgotten fan," it frequently breaks down from lubrication neglect. Utility has made sure this can't happen — all sizes feature permanently sealed, pre-greased ball bearings. They're forever impervious to dirt, moisture, and drastic temperature changes and require no further lubrication.

Manufacturers of heavy and standard duty blowers for heating, air conditioning and ventilating installations. Producers of blowers and blower parts for original equipment manufacturers. Write for catalogue data.

UTILITY

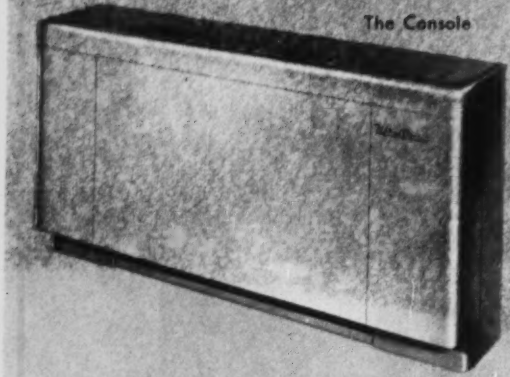
UTILITY FAN CORPORATION 911 East 59th Street, Los Angeles 1, California

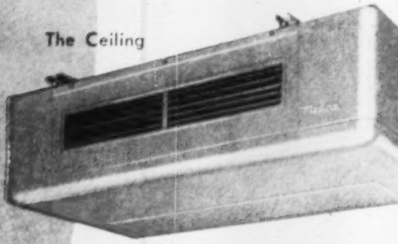
A DIVISION OF UTILITY APPLIANCE CORPORATION

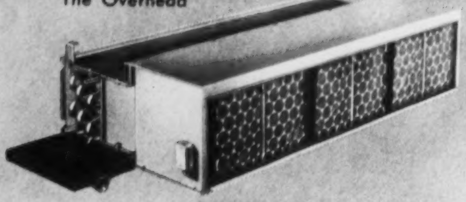
--for the finest in

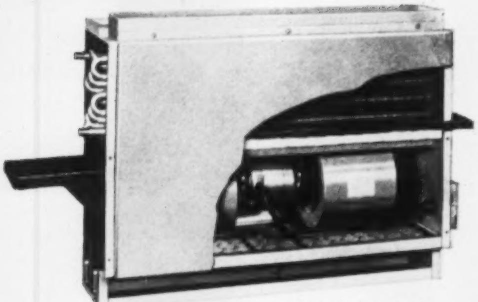
choose from the advance

for hotels, apartments, institutions, homes . . .

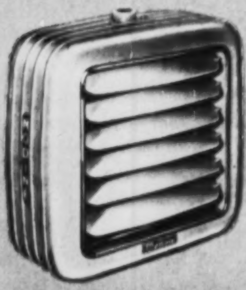

The Console


The Ceiling


The Overhead


The Concealed

for hot water and steam . . . advance engineered



Modine UNIT HEATERS

. . . include new power-throw units

For steam, Modine builds 26 sizes of vertical (includes 13 sizes of low outlet temperature models), 19 sizes of horizontal (includes 9 low outlet temperature models), and 10 sizes of power-throw units. For hot water, Modine builds 13 sizes of vertical and 15 sizes of horizontal units.

A fully coordinated line of Modine Unit Heaters offers expanded opportunities for unit heater application. Individually or in combination, they meet exacting engineering demands of any space heating problem. Lower outlet temperatures—110°-120° zone—for balanced performance, with velocities and volume correctly related.

All Unit Heater casings are Bonderite-treated to prevent rust and bond paint to steel. Continuous-duty, totally enclosed fan type motors are rubber mounted.

Easy to install! Direct-from-pipe line suspension for low cost, fast installation of all Horizontal types. Accurately rated in strict accordance with the Standard Test Code for Unit Heaters.

air conditioning, heating, ventilation

engineered Modine line

advance engineered

Modine AIRditioner

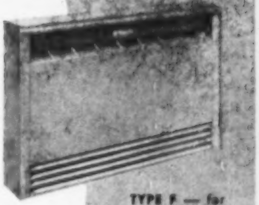
Provides cooling with chilled water, heating with hot water—from a central source—while it filters, de-humidifies, introduces and circulates fresh air. It's the unit designed to provide year-round comfort in multi-room installations . . . on a modest budget. Four-speed control on quiet motor for maximum adaptability to conditions.

Four types of AIRditioners now available. Each is offered in three sizes, rated at ⅔, 1½ and 2 tons of refrigeration (220, 440 and 640 cfm) respectively.

All Modine AIRditioners are designed and advance-engineered for fast, easy installation and quick access to all connections and parts. Casings are Bonderite-treated and finished in a semi-gloss Marine Green Primer.

advance-engineered
MODINE CONVECTOR RADIATION UNITS
for unmatched performance

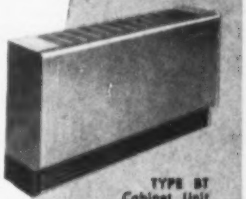
There's beauty combined with outstanding performance in Modine Advance-Engineered Convectors. And they are available in all Standard enclosure styles, as well as in heavy-duty Institutional models. Enclosures Bonderite-treated. Accurate ratings in conformance with Commercial Standard CS-140-47, as developed by the *National Bureau of Standards* and approved by the Convector Rating Committee.



TYPE F — for complete or partial recessing in wall, or for flush-to-wall installation.

advance-engineered
MODINE CABINET UNITS
for low-cost heating and cooling

Modine Cabinet Units are Advance-Engineered to provide economical heating, cooling and ventilating. A single Cabinet Unit can provide quick, positive, quiet distribution of heated or cooled air — with or without ducts. Five different models provide (1) heating with steam or hot water and (2) cooling with chilled water in addition to heating. Various combinations permit free-standing, recessed and concealed installations — floor, wall or ceiling mounting.



TYPE BT Cabinet Unit

advance-engineered
MODINE HEATING COILS
for use with steam or hot water

The extensive line of Advance-Engineered Modine Heating Coils is built to meet the diversified needs of modern air-handling systems. In addition to more than 1200 cataloged heating coils for use with steam or hot water, Modine produces many custom built coils for installation in air-handling equipment produced by other firms. Types include standard and nonfreeze heating and booster coils, and hot water heating coils.

Standard Heating Coil

TODAY, more than ever, look to Modine — the advance-engineered line — for the best in air conditioning and heating equipment!

Modine

. . . leading the industry for 25 years

MODINE MFG. CO., 1509 DEKOVEN AVE., RACINE, WIS.

advance engineered

Modine GAS-FIRED UNIT HEATERS

weigh less . . . require less space

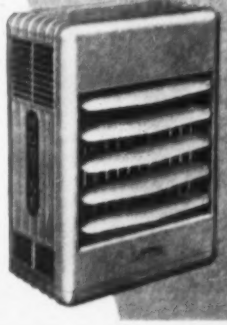
Actually half the weight . . . half the size . . . of the average of 7 other leading gas units producing equivalent Btu's!

As the leader in unit heating for more than 25 years, Modine brings unequalled experience to unit heating problems.

New Modine Gas-Fired Units are the *only* units with both *stainless steel burners* and a choice of stainless or aluminized steel heat exchangers. Lighter weight means easier, less expensive installation plus faster heat delivery . . . within five seconds after thermostat calls for it. And, naturally, this stainless steel design means greatest resistance to corrosion. Individually fired tubes provide higher heat transfer. Elongated ports—four times free area of conventional drilled ports—minimize clogging and simplify cleaning.

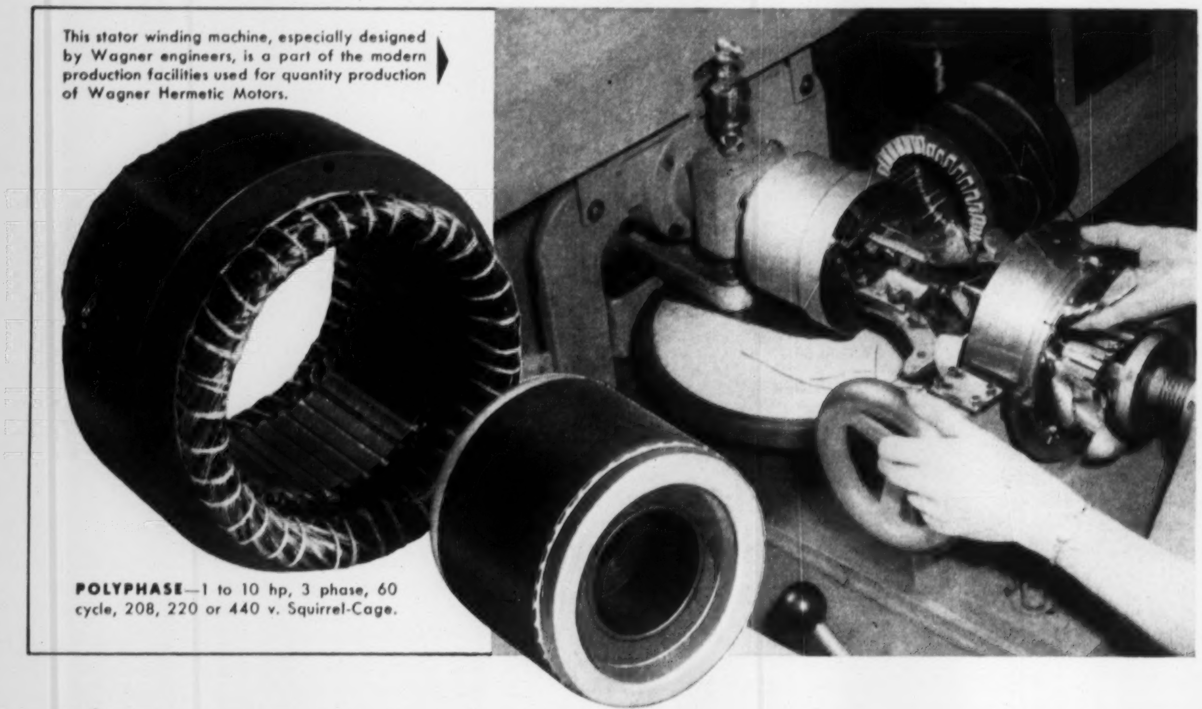
Seven sizes—from 25,000 to 220,000 Btu. A.G.A. and C.G.A. approved for natural, mixed, manufactured L.P. and L.P.-air gases.

UR-1231



Wagner®
ELECTRIC MOTORS
... the choice of leaders in industry

Design a Wagner Hermetic Motor into your next sealed unit



This stator winding machine, especially designed by Wagner engineers, is a part of the modern production facilities used for quantity production of Wagner Hermetic Motors.

POLYPHASE—1 to 10 hp, 3 phase, 60 cycle, 208, 220 or 440 v. Squirrel-Cage.

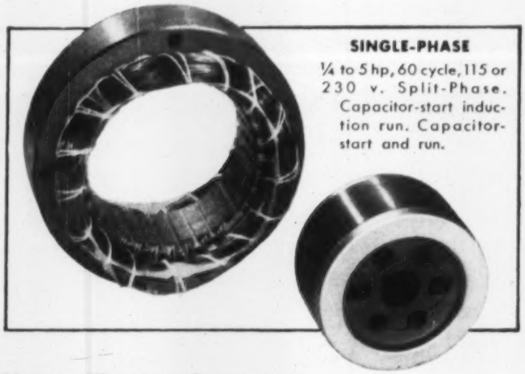
YOU'LL GET ... carefully built, thoroughly tested, performance-proved motors that you can seal for life!

Wagner hermetic motors, like all Wagner motors, are known for their ability to give years of trouble-free service. Wagner hermetics are built on modern production lines—with the newest, finest production tools available. Repetitive surge and dielectric tests are given to every Wagner hermetic motor stator. Every rotor that goes into a Wagner hermetic motor is given an individual speed test.

Such exacting manufacturing techniques and quality control enable us to provide you, the manufacturer, with hermetic motors that will give years and years of dependable service ... motors on which you can safely stake the reputation of your product.

When your motor drives are to be hermetically sealed, it's to your advantage to specify Wagner for use on your equipment. Get the facts ... call the nearest of our 32 branch offices or write us.

POLYPHASE		SINGLE-PHASE	
TYPE	RATINGS	TYPE	RATINGS
NP, Squirrel-Cage	1 to 10 hp, 3 phase 60 cycle, 208, 220 or 440 v.	NB—Split-Phase NK—Capacitor-start induction run NY—Capacitor-start and run	¼ hp, 60 cycle, 115 v. ¼ to ¾ hp, 60 cycle, 115 or 230 v. ½ to 5 hp, 60 cycle, 230 v.



SINGLE-PHASE
¼ to 5 hp, 60 cycle, 115 or 230 v. Split-Phase. Capacitor-start induction run. Capacitor-start and run.

Wagner
Electric Corporation
EST. 1891

Wagner Electric Corporation
6370 Plymouth Ave., St. Louis 14, Mo., U. S. A.

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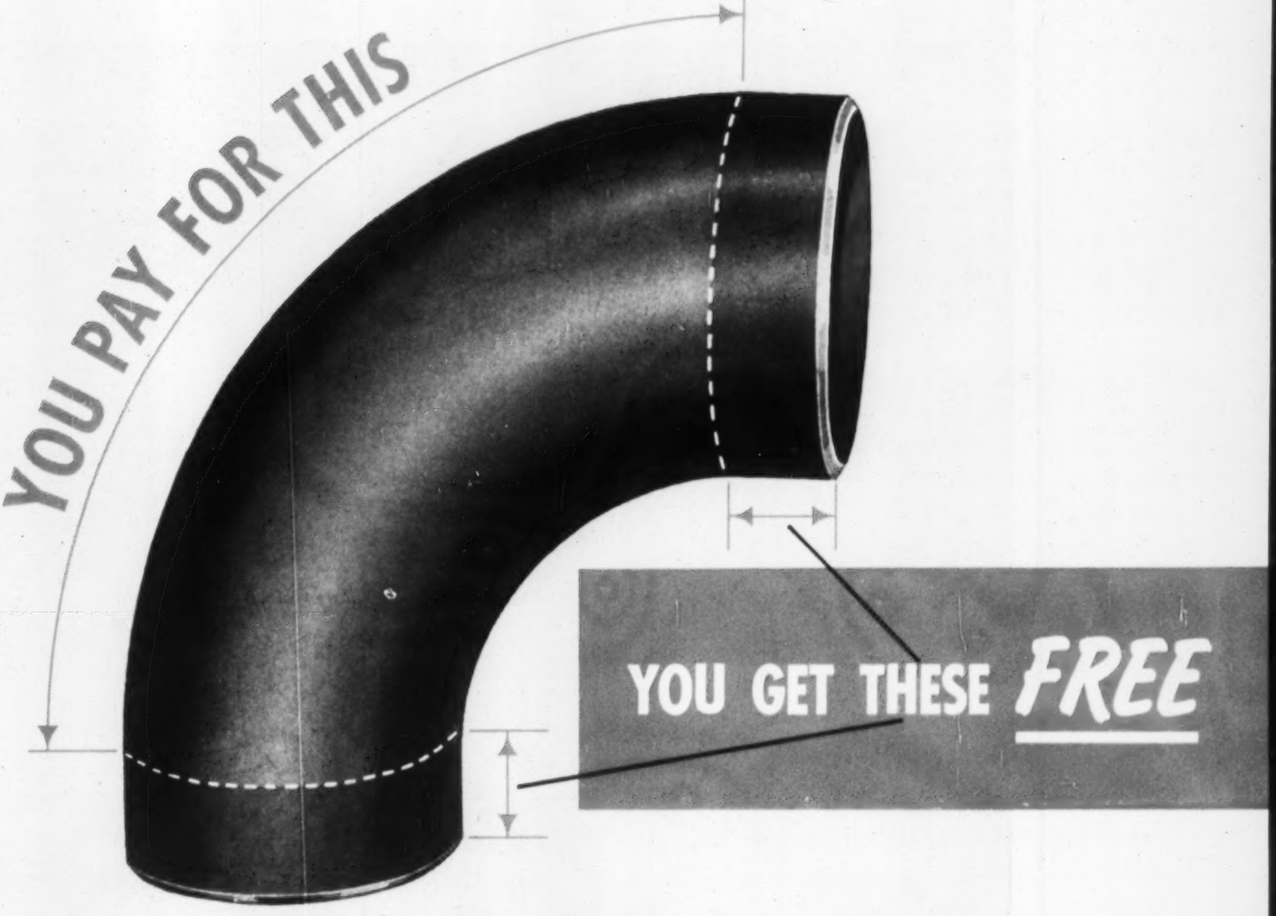
H56-2

ELECTRIC MOTORS · TRANSFORMERS · INDUSTRIAL BRAKES · AUTOMOTIVE BRAKE SYSTEMS–AIR AND HYDRAULIC

MIDWEST "LONG TANGENT" ELBOWS



In no other welding elbow do you get this "bonus" of long tangents. The dotted lines show where standard elbows end. Each shaded straight end equals ¼ of the nominal fitting diameter . . . a 12" Midwest "Long Tangent" Elbow has tangents 3" long. As a result of the advantages listed at the right, substantial savings are made on many piping systems by using Midwest "Long Tangent" Elbows . . . which cost no more than other elbows. For further information, write for Catalog 54.

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Boston 27—426 First St. • Los Angeles 33—520 Anderson St.
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Cleveland 14—616 St. Clair Ave. • Miami 34—2103 Le Jeune Rd.
STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

ADVANTAGES OF MIDWEST "LONG TANGENT" ELBOWS

- ★ They save pipe.
- ★ They often eliminate short nipples and their extra welds.
- ★ They save time and money in lining up and clamping pipe and fitting.
- ★ They make it easier to apply slip-on flanges.
- ★ They remove the circumferential weld from point of maximum stress and can be sleeved.
- ★ THEY COST NO MORE THAN OTHER ELBOWS

MIDWEST HAS THE MOST COMPLETE LINE

7325

MIDWEST WELDING FITTINGS IMPROVE PIPING DESIGN AND REDUCE COSTS

® AAF ANSWERS YOUR

Complete Line Permits Coordinated Planning, Lower Over-all Costs!

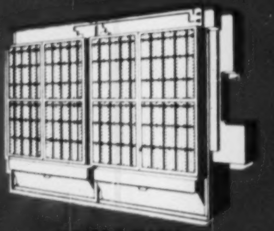
FOR more than 30 years, American Air Filter and its Herman Nelson Division have concentrated on making AIR a better commodity for home, school and industry. The products pictured here are only a portion of the complete AAF-Herman Nelson line. Each was developed to meet a specific need; solve a definite problem.

This concentration on "better air" has led to the development of the following:

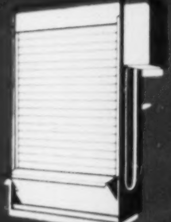
- *a line of Air Filters utilizing ALL the principles of air filtration—electronic precipitation, dry filtration and viscous impingement.*
- *a complete line of Herman Nelson Heating and Ventilating products, from propeller fans to unit ventilators.*
- *the world's most complete line of Dust Control equipment, including dynamic precipitators, hydro-static precipitators, dry centrifugals and fabric arresters.*

You draw on this vast "across-the-boards" experience when you select products of the American Air Filter Company. If it's an AIR problem, call your AAF representative. He's listed in your Classified Directory.

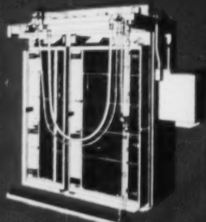
AIR FILTERS



ELECTRO-MATIC
Electronic, Self-Cleaning Precipitator

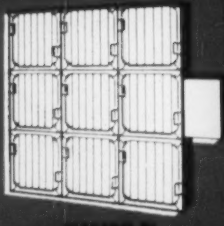


MULTI-DUTY
Self-Cleaning Air Filter

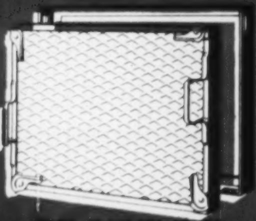


ELECTRO-CELL
Cell-Type Precipitator
With Type H Washer

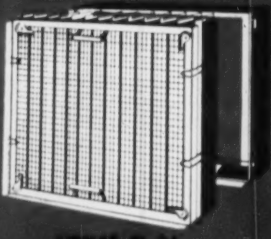
ROLL-O-MATIC
Automatic, Renewable Media
Air Filter



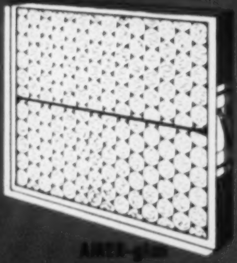
ELECTRO-PL
Dry-Type Electronic Filter



TYPE M/W-HV UNITS
Washable Unit Filters



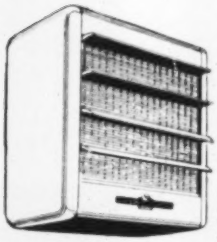
AIRMAT PL-24
Dry Filter



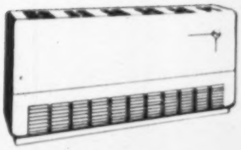
AMER-glas
Replaceable Type Air Filter

. . . pioneers in Air Care . cleaning, heating and moving air

AIR PROBLEMS!

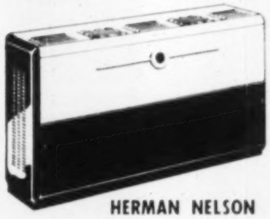


UNIT HEATERS
For Steam, Hot Water and Gas

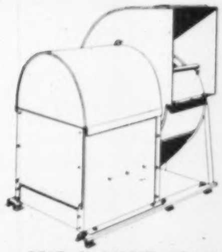


CONSOLE HEATERS

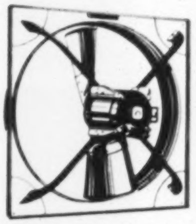
HEATING AND VENTILATING PRODUCTS



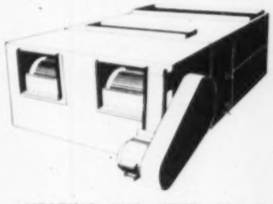
HERMAN NELSON
UNIT VENTILATORS



BELT & DIRECT DRIVE
UNIT BLOWERS

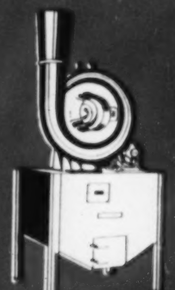


BELT & DIRECT DRIVE
PROPELLER FANS

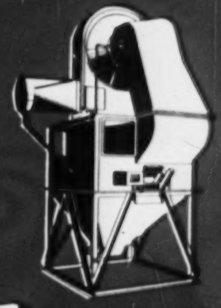


HEATING AND VENTILATING
UNITS

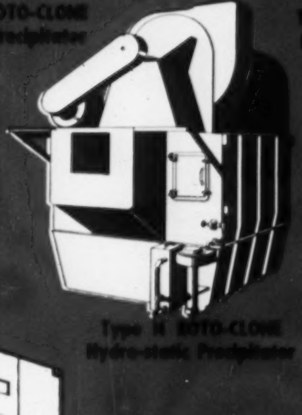
DUST CONTROL EQUIPMENT



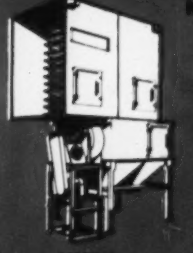
Type D ROTO-CLONE
Dynamic Precipitator



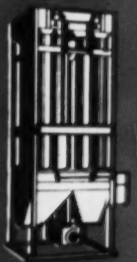
Type W ROTO-CLONE
Dynamic Precipitator



Type N ROTO-CLONE
Hydro-static Precipitator



AMERclone
Dry Centrifugal Collector



AMERtherm
Fabric Dust Arrester

AAF

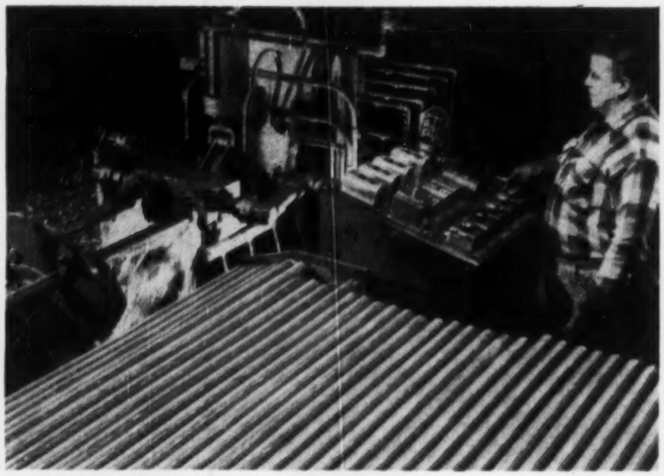
herman nelson

American Air Filter
COMPANY, INC.

American Air Filter of Canada, Ltd., Montreal, P. Q. • 373 Central Avenue, Louisville 8, Kentucky

These Men at ETNA Make Sure Your SPANG CW Steel Pipe Is TOP-QUALITY

These testing and inspection experts at Etna represent you at the mill to be sure you get *top-quality* pipe every time you order Spang CW Steel Pipe. Careful control like this is a habit at Spang, and that's why *quality-controlled* Spang CW is your best buy for every type of piping installation. See your local Spang Distributor for your next pipe order!



Meet Al Badack, a member of the day-turn testing team at Spang's Etna (Pa.) Plant. Al, who has worked at Spang for nine years, is applying the hydrostatic water test to two lengths of Spang CW Steel Pipe. Test pressures are applied at readings well above actual *working pressures* for which the pipe is designed. This hydrostatic test assures you that each length of *top-quality* Spang Pipe you buy has a strong weld and will more than meet your pressure specifications.

These men are Chester Galda and Steve Ajjnich, two members of Spang's inspection team at Etna. Chester, a 22-year man with Spang, is surface-inspecting coupling fit-up of Spang CW Steel Pipe. Steve, a veteran of 44 years with Spang, inspects each length with the aid of a fluorescent light to be sure the threads and the pipe are uniform and free of any defects. Any length that does not meet Spang's *top-quality* specifications is rejected.

SPANG CW® STEEL PIPE

SPANG-CHALFANT
DIVISION OF THE NATIONAL SUPPLY COMPANY
General Sales Office: Two Gateway Center, Pittsburgh, Pa. District Sales Offices: Atlanta, Boston, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, St. Louis

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Wrought Iron

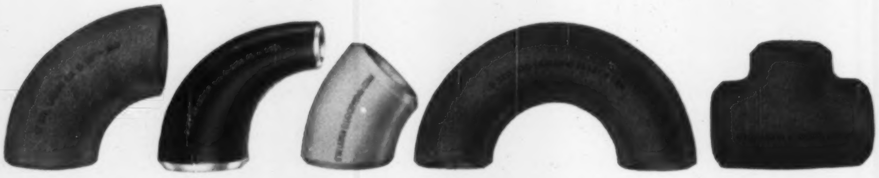
Chromium Type Stainless

Chromium-Nickel Stainless

Molybdenum Type Stainless

Wrought Aluminum

Aluminum-Copper Alloys

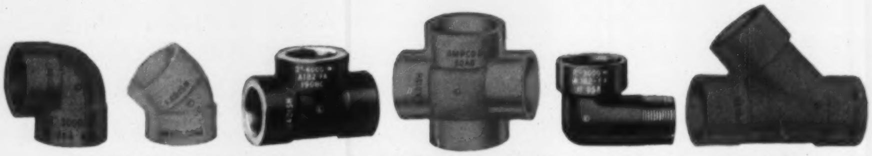


BUTT WELDING FITTINGS

½ inch through 42 inches . . .

FORGED CORROSION RESISTANT—LIGHT WEIGHT and A.S.A. FLANGES

½ inch through 24 inches . . .



FORGED SCREWED OR SOCKET WELDING FITTINGS and UNIONS

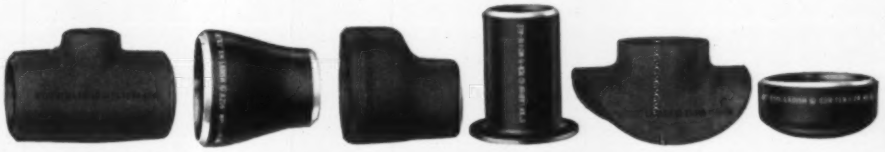
⅛ inch through 4 inches . . .

LARGE DIAMETER AND T.E.M.A.* STANDARD FLANGES up to 20 feet O.D.

*Tubular Exchanger Manufacturers Association

LONG WELDING NECKS up to 24 inches, 150 lb. through 2500 lb.

Complete Service . . .

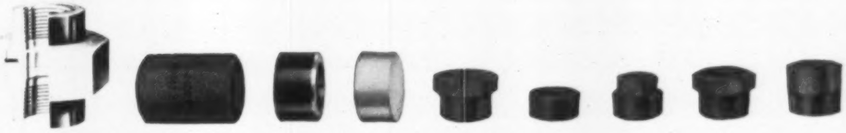


BUTT WELDING FITTINGS

Schedules 5S, 10S, 40S, 80S, and other Schedules and wall thickness.

FORGED CORROSION RESISTANT—LIGHT WEIGHT and A.S.A. FLANGES

150 lb. through 2500 lb. pressure ratings.



FORGED SCREWED OR SOCKET WELDING FITTINGS and UNIONS

150 lb. Corrosion Resistant and 2000 lb. through 6000 lb. ratings.

FOR FITTINGS FROM ANY FORGEABLE MATERIAL TO MEET YOUR SERVICE REQUIREMENTS

You get prompt, efficient service when you specify and order from the complete Ladish Controlled Quality line. Fittings *in any forgeable material* in virtually every type, size, wall thickness or pressure rating . . . are produced to one uncompromising Controlled Quality standard . . . and identified with heat code symbols pioneered by Ladish as verification of metallurgical integrity resulting from exhaustive tests made in the Ladish metallurgical laboratories.

For *complete service* on your fittings requirements, depend on the Ladish line and the services of your Authorized Ladish Distributor.

THE COMPLETE *Controlled Quality* FITTINGS LINE

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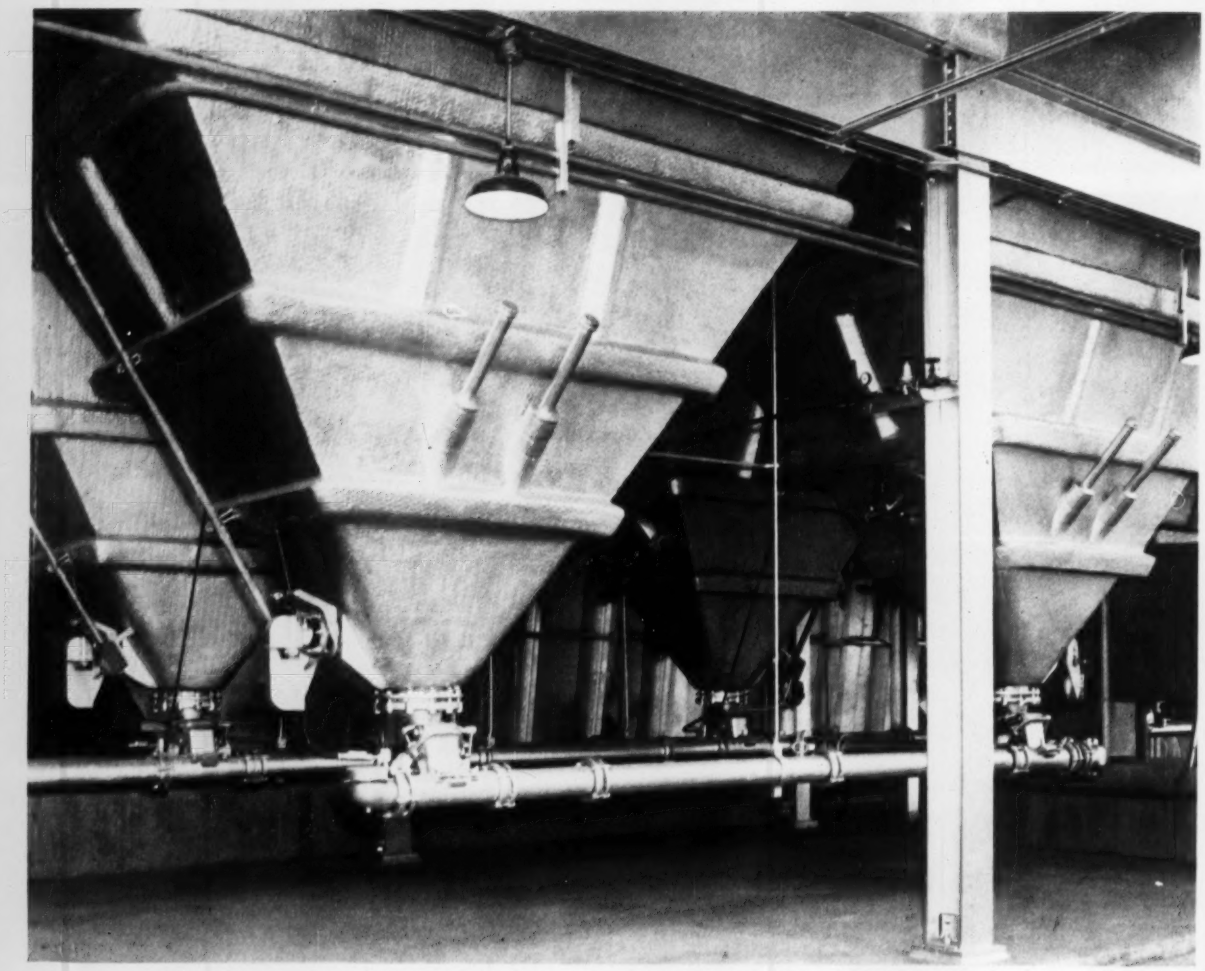
Inconel

Monel



HEAT LOSSES ARE MINIMIZED—by K&M "Featherweight" 85% Magnesia insulation on these fly-ash hoppers at the Meramec Power Plant of the Union Electric Company of Missouri, St. Louis. It is highly efficient to 600°F. Elsewhere in the plant, "Featherweight" is applied in combination with K&M Hy-Temp for efficiency to 1900°F. Insulation contractor: Armstrong Cork Company.

Keep steam hotter—longer—at less cost—
with K&M thermal insulations

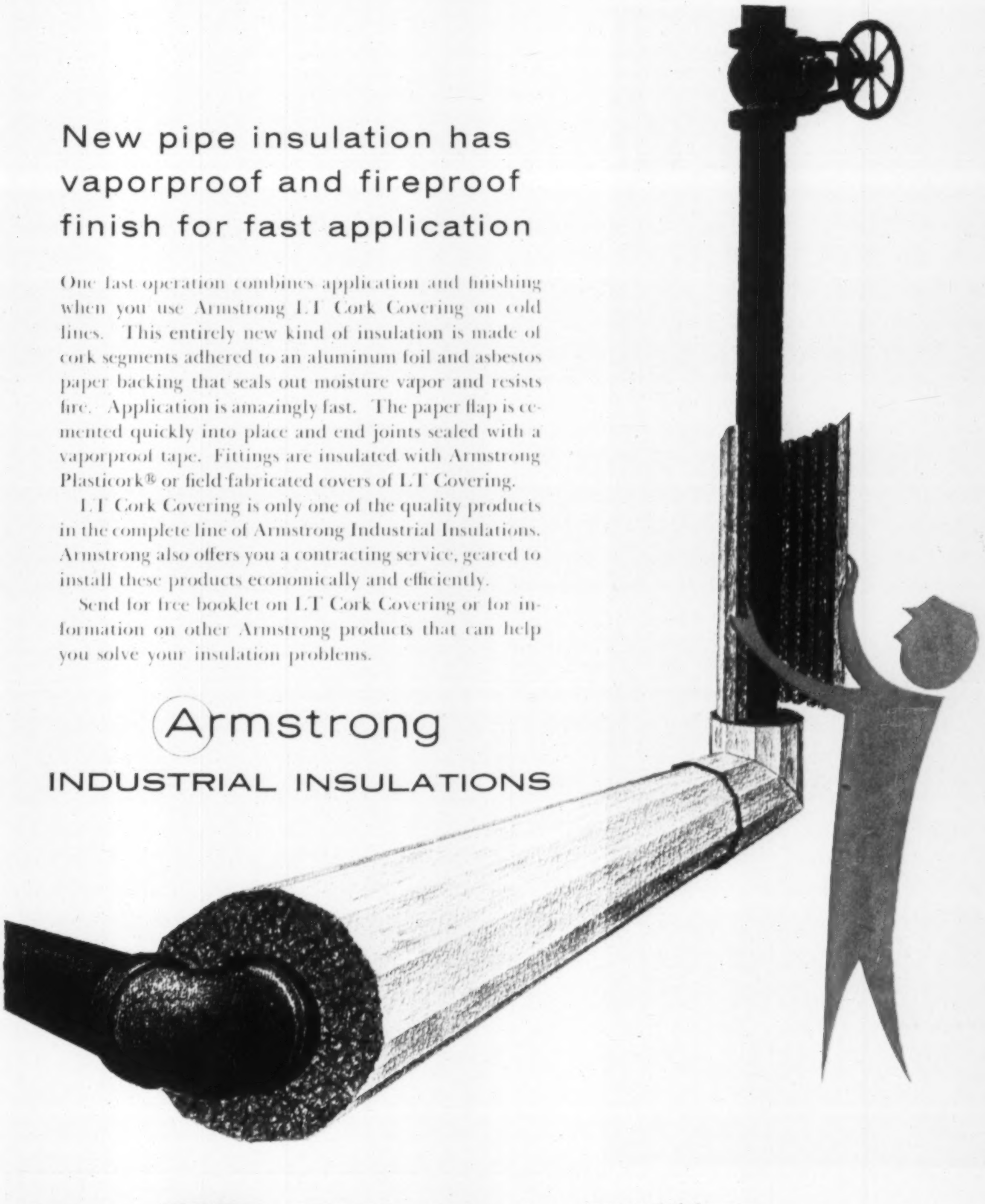
K&M insulations give you highly efficient, cost-cutting insulation in every service temperature range. Whether used for maximum conservation of heat, protection of personnel, or control of room temperature, these insulations have proved their effectiveness through more than 65 years of use. K&M "Featherweight"® 85% Magnesia and K&M Hy-Temp insulations will serve for the life of your equipment. For efficiency to 1900° F., they are applied in combination, with staggered joints. This eliminates the heat loss that normally occurs in single-layer installations when expansion causes joints to open. Where severe water exposure or high humidity may be a problem, K&M "Featherweight" Water-Resistant Magnesia insulation is especially effective to 450° F.

Your K&M Distributor—who is an experienced applicator—will be glad to give you complete information on K&M thermal insulations. Or, write us.

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

K&M best in asbestos

New pipe insulation has vaporproof and fireproof finish for fast application



One fast operation combines application and finishing when you use Armstrong LT Cork Covering on cold lines. This entirely new kind of insulation is made of cork segments adhered to an aluminum foil and asbestos paper backing that seals out moisture vapor and resists fire. Application is amazingly fast. The paper flap is cemented quickly into place and end joints sealed with a vaporproof tape. Fittings are insulated with Armstrong Plasticork® or field-fabricated covers of LT Covering.

LT Cork Covering is only one of the quality products in the complete line of Armstrong Industrial Insulations. Armstrong also offers you a contracting service, geared to install these products economically and efficiently.

Send for free booklet on LT Cork Covering or for information on other Armstrong products that can help you solve your insulation problems.

Armstrong

INDUSTRIAL INSULATIONS

Armstrong LT Cork Covering, a New Cold Line Insulation

Armstrong Armaflex*, a Flexible Plastic Pipe Insulation

Armstrong Armaglas* Duct Insulations

Armstrong Insulcolor®, Weatherproof Coating in Seven Colors

Armstrong Cork Company
2001 Sherman St.
Lancaster, Penna.

Please send me the free booklets checked.

Please have an Armstrong representative call.

Name ....

Position ....

Company ....

Address ....

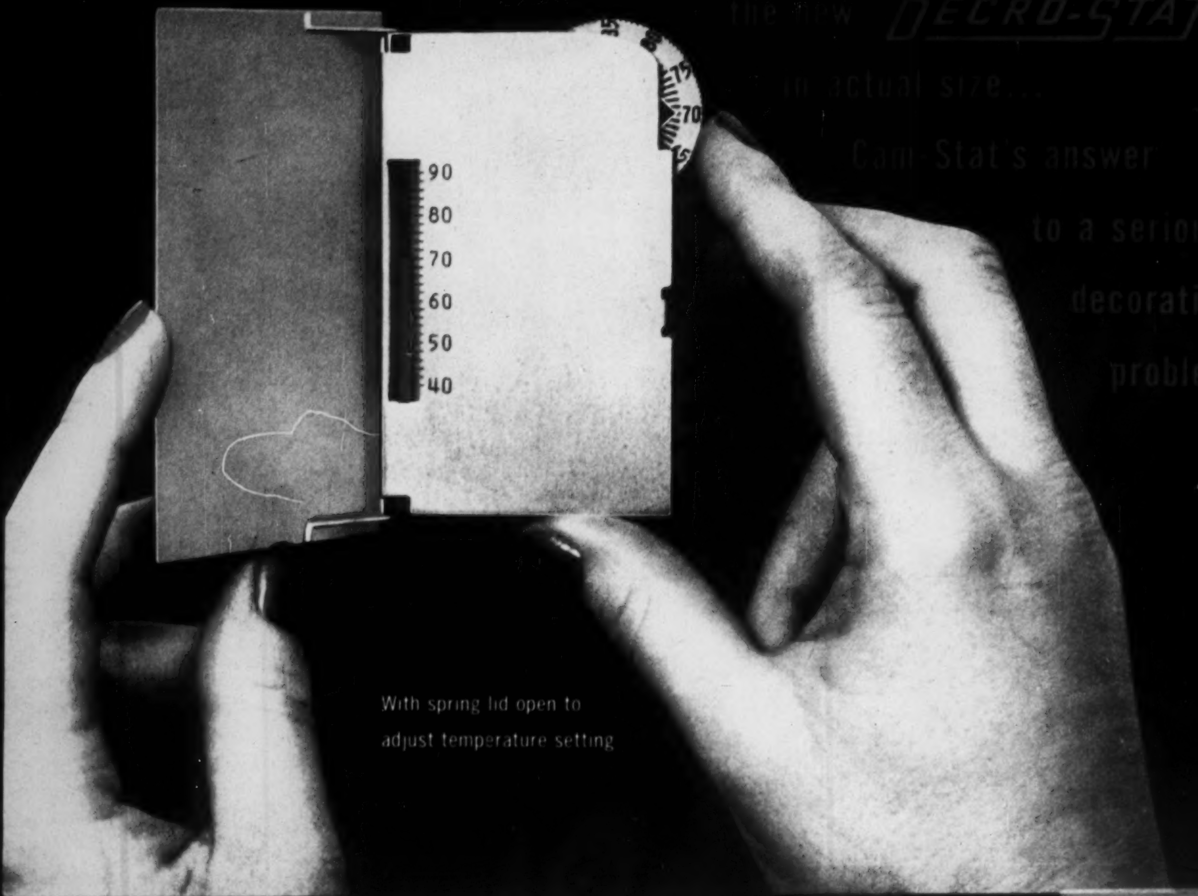
City .... Zone ...... State ....

*TRADE-MARK

At last!

a room thermostat that does not disfigure the beauty of a room

Lid comes in a brushed stainless finish



With spring lid open to
adjust temperature setting

the new DECRO-STAT
in actual size...
Cam-Stat's answer
to a serious
decorating
problem

Can be wallpapered to match wall

Can be painted to match wall

Now, solid comfort does not require homely gadgets.

Decro-Stat lid size is only 3-9/16″ x 2-9/32″.

Extends out from wall only 13/16″.

Comes with or without thermometer as desired.

Thermometer is visible or under spring lid.

Adjusting dial is visible or under spring lid.

High precision calibration for complete comfort.

Adjustable heat anticipator for all control systems.

Multiple gold contacts for positive contact.

Adjustable differential.

Low mass bimetal for quick response.

All of these features and SENSIBLY PRICED, too!

Can be engraved or monogramed

CAM-STAT

Division of the Paul Henry Company
11833 West Olympic Blvd., Los Angeles, Calif.

No thermostat can excel Cam-Stat's record of fine service

REALLY CONTROL AIR

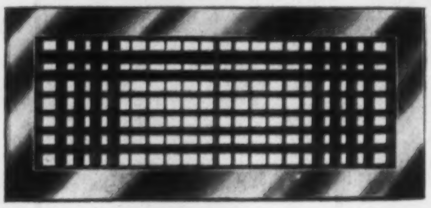
Specify Titus grilles and *know* that you can create the air patterns necessary to meet individual requirements of room and occupant . . . *ANY SEASON OF THE YEAR.*

Know that you can *pinpoint* the air stream to a specific area . . . or *diffuse* it . . . or *deflect* it . . . or *turn* it . . . or *reverse* it . . . or *blanket* a certain part of a room. ACCOMPLISH THIS WITH QUICK, SIMPLE, EASY, INDIVIDUAL ADJUSTMENTS OF THE LOUVERS . . . without removing grilles from the walls.

. . . . REMEMBER:

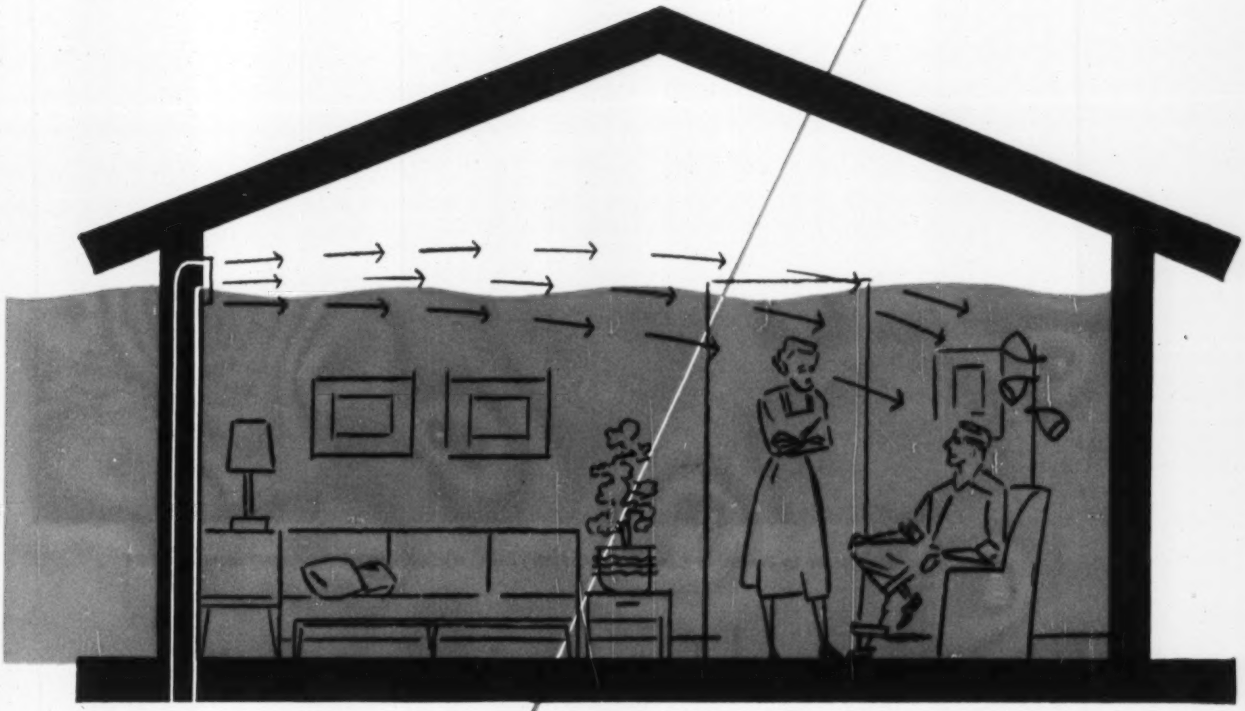
DON'T TAKE ANY SHORT CUTS HERE . . . THE OUTLET CAN MAKE OR BREAK THE PERFORMANCE OF YOUR ENTIRE HEATING OR COOLING SYSTEM . . . there are basically only 3 places you can place an outlet . . . in the wall, ceiling, or baseboard—but there are literally hundreds of different air patterns that may be required from that outlet. That's why Titus grilles with MORE AIR CONTROL PER SQUARE INCH assure better performance from any forced air heating or cooling system.

Room comfort is directly proportioned to how forced air is handled in the occupied zone ***(the region within a room between floor and the 72" level)*** **. . .** ***and this is the only area where the entire unit's cooling and heating performance is judged.***



TITUS GRILLES

. . . in the OCCUPIED ZONE



eliminate draft problems

FOR MORE Complete information on *"HOW TO CONTROL AIR IN THE OCCUPIED ZONE"* write for FREE CATALOGS.

TITUS MFG. CORP.
Waterloo, Iowa

Gentlemen: Please rush me complete free information on:

☐ Supply Grilles & Registers
☐ Volume Controllers
☐ Frames and Accessories
☐ Return Air Grilles
☐ Gymnasium Grilles
☐ Perimeter Diffusers

Name____________________________

Company____________________________

Address____________________________

City________________ State____________

KROGER
Baye Schwind
SHINNER

Bay Shore Shopping Center, Milwaukee, Wisconsin. Owned by Bay Shore Center, Inc.; Architect—M. O. Nathan; Builder—Sheldon Thomas, Inc.; G-E

Wisconsin shopping center comfort with 664 tons of G-E

Larger Bay Shore stores utilize up to four G-E units. Smaller stores require only a single G-E unit of 3 to 15-ton capacity. Offices are serviced by units grouped in central machinery rooms.

81 G-E Packaged Air Conditioners permit individual indoor weather control in 47 stores, 60 offices of Bay Shore Shopping Center in Milwaukee

Every office and store of mammoth (315,000 square feet) Bay Shore Shopping Center, largest in Wisconsin, developed by C. M. Redman, is "comfort serviced" by 81 G-E Packaged Air Conditioners. All units, totalling 664 tons, are located out-of-space — not a single square foot of sales or office space is lost.

Installations were made on a highly flexible, individual basis as the center grew and as leases were signed. Working closely with the architect, the G-E contractor coordinated air conditioning with building design and layout — meeting (1) changes in plans with minimum inconvenience and delay;

packaged units installed by Conditioned Air Equipment Co., Minneapolis, Minn.

gets year-round Air Conditioning

(2) the special needs of each lessee at minimum cost to Bay Shore management.

Throughout hot weather, each store and office controls its own indoor temperature and humidity. Ductwork and grilles are used both summer and winter. For winter heat, some units have heating coils. Write for data to General Electric Company, Commercial & Industrial Air Conditioning Department, 5 Lawrence St., Bloomfield, New Jersey.

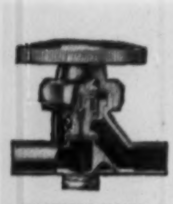
CHECK THESE ADVANTAGES OF USING G-E PACKAGED AIR CONDITIONERS

- Low installation, low operating costs.
- Complete line of vertical floor-mounted and horizontal ceiling-fastened units gives the architect maximum design freedom. Units can be used in space or concealed, with or without ducts. Horizontal units are both air cooled and water cooled.
- 3, 5, 7½, 10 and 15-ton units can be used singly or in multiple to meet air conditioning needs of any building.
- Easily directed air flow for no-draft no-waste air circulation.
- Built and factory assembled by General Electric. 5-year warranty covers entire sealed cooling system.

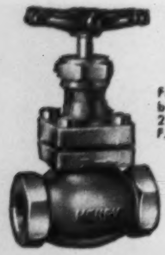
Packaged AIR CONDITIONERS

Progress Is Our Most Important Product

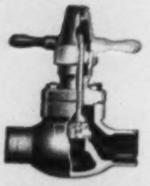
GENERAL ELECTRIC



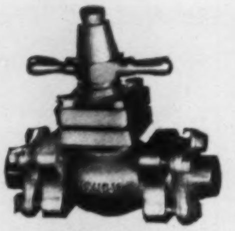
PACKLESS VALVE
With balanced-action. Sizes ¼" through ⅝" Fl., ¼" through 1⅝" O.D.S.



AMMONIA VALVE
Forged steel or semi-steel bodies. Sizes ¼" through 2½" F.P.T., 1¼" through 6" F.P.T. slip-on welding or welding neck flanges.



WING CAP VALVE
Non-ferrous. Sizes ⅞" through 4⅛" O.D.S.



WING CAP VALVE
Semi-steel screwed or flanged types. Sizes 1¼" through 6".

HENRY VALVE CO
CONTROLLING FLOW

you pay—
no premium for..
the extra advantages found in
Henry products
or for the extra satisfaction that follows their use

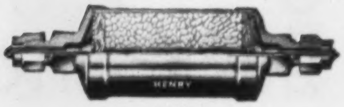
STRAINER
Angle type with patented distortion-type flange. Sizes ⅜" through 4⅛" O.D.S., 2½" through 4" butt weld.

Y-STRAINER
Brass plated. Welded steel construction. Forged brass connections. Sizes ⅝" through 4⅛" O.D.S., 2½" through 4" butt weld.

BALANCED-ACTION PACKLESS LIQUID LEVEL GAUGES
Valves are backseating—diaphragms may be inspected or replaced without loss of liquid. Conforms with all safety code requirements. Also packed types, capped or with hand wheels.

CHECK VALVE
Piston Type For Freon. Sizes ⅜" through 4⅛" O.D.S.

DRIER
Cartridge type 12 to 500 cu. in. capacity. Sizes ⅜" to 2⅛" O.D.S



DRIER
Large diameter and capacity. All brass construction. Minimum pressure drop.

... Write for these catalogs

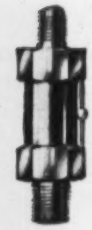
No. 101 Packless and packed valves, strainers, driers, check valves, relief valves, three-way valves, liquid gauge sets, flange unions and accessories for air conditioning, refrigeration and industrial uses.

No. 201 Ammonia valves and accessories.

No. 71 Drop forged and cold rolled steel fittings.

DIAPHRAGM RELIEF VALVE
Operates independently of outlet pressure permitting use of rupture disc assembly on outlet side without increasing initial leak pressure. Forged brass bodies. Sizes, ⅜" & ½" I.P.S., ⅝" & ⅞" O.D.S.

UV NB



STRAIGHT-THROUGH RELIEF VALVE
Large capacity—All brass construction. Sizes ½" through 1" P.T. Meet A.S.M.E. standards, National Board Certified. Other sizes and types available.

Stocked and Sold by Leading Jobbers

VALVES • DRIERS • STRAINERS • CONTROL DEVICES and ACCESSORIES FOR REFRIGERATION and AIR CONDITIONING and INDUSTRIAL APPLICATIONS

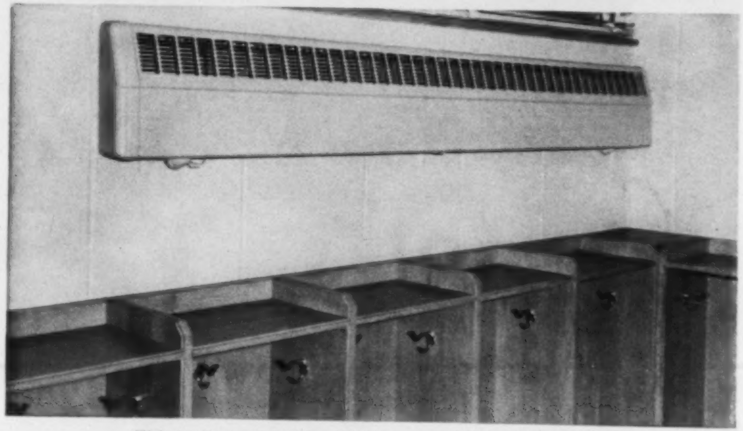
HENRY VALVE COMPANY

MELROSE PARK, ILLINOIS Chicago Suburb • Cable: HEVALCO, MELROSE PARK, ILLINOIS

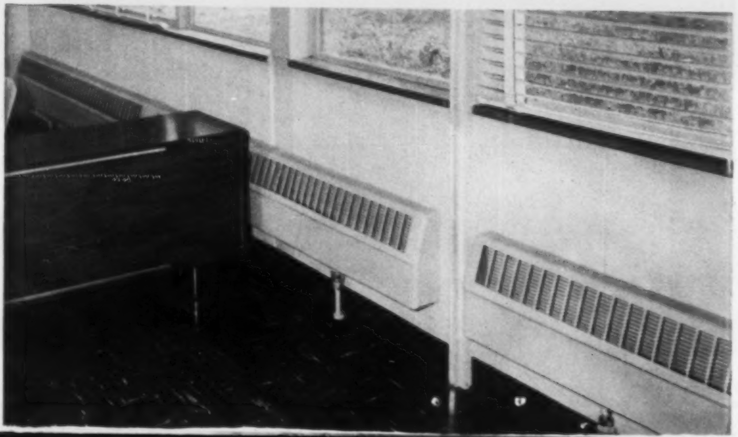
New
Beauty
Webster
WALVECTOR

Turn here for the exciting word-and-picture story

Webster Walvector in new offices of Colonial Mortgage Service Co., Upper Darby, Pa.



Webster Walvector in new Walt Disney School, Levittown, Pa.
Below – principal's office. Above – over "cubbies" in cloak room.



New Beauty

In Tru-Perimeter Heating

Webster Walvector – first to extend Tru-Perimeter steam and hot water heating advantages into non-residential construction – now provides, in addition, new beauty together with increased ruggedness. Maintains the same ratings, same ease of installation, same savings in initial installation cost over conventional convectors. For details, see your Webster Representative, or write us.

Webster
WALVECTOR

WARREN WEBSTER & COMPANY, CAMDEN 5, NEW JERSEY

LOCATED NEAR YOU – TO HELP YOU. Webster Representatives in these 67 U.S. Cities: Albany, Atlanta, Atlantic City, Baltimore, Bethlehem, Birmingham, Boston, Buffalo, Butte, Chattanooga, Chicago, Cincinnati, Cleveland, Columbia, Columbus, Dallas, Davenport, Dayton, Denver, Des Moines, Detroit, Grand Rapids, Harrisburg, Houston, Indianapolis, Kansas City, Kingston, La Porte, Little Rock, Los Angeles, Louisville, Lubbock, Memphis, Milton, Milwaukee, Minneapolis, Nashville, Newark, New Haven, New Orleans, New York, North Hero, Oklahoma City, Omaha, Orlando, Philadelphia, Pittsburgh, Portland, Raleigh, Richmond, Rochester, Saginaw, St. Louis, Salt Lake City, San Antonio, San Francisco, Seattle, Spokane, Springfield, Syracuse, Toledo, Trenton, Tulsa, Washington, Wichita, Wilmington, Woodward . . . In Canada, Darling Brothers, Ltd., Montreal.

WATERLOO

Offers You
3 IMPORTANT CHANGES for 1956
To Facilitate Selection of Proper Air Diffusion Equipment

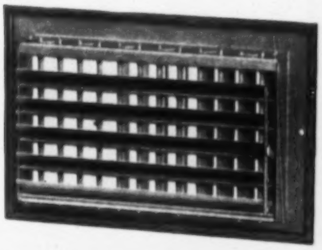
NEW • • at Waterloo AIR DIFFUSION EQUIPMENT

In our constant endeavor to give you what you want, when you want it, at the price you want to pay, we have made some revisions in our line for 1956, which we are confident will meet with enthusiastic approval:

DESIGN

NEW! NARROW STACK DEPTH

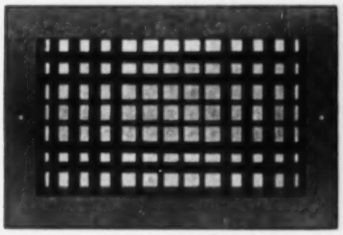
Our new narrow stack depth makes it possible to adapt the more efficient type of Commercial register to the home air conditioning field, and INTERCHANGEABLE for use in both commercial and home structures.



COLOR

NEW! DECOR COLOR-STYLING

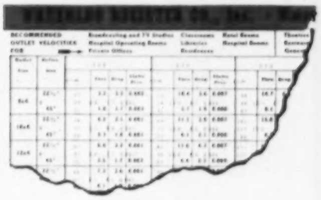
Waterloo Air Diffusion Equipment is now primer finished in a new soft beige-gray color-styling, which gives each unit a lasting decorative appearance without additional decoration.



EASY SELECTION

NEW! SIZE SELECTION TABLE

Newest, most complete easiest to read Size Selection Table in the Register Industry, with all salient features emphasized in red. Available in 6-page folder, on request, without cost or obligation.



Facilities to Give You UNUSUAL SERVICE

Solve your delivery problems with WATERLOO Emergency Service. While we have prided ourselves on previous delivery records, we are now expanding our facilities so we can continue to give you the fast service which has meant so much in the continuous growth of WATERLOO—"Since 1902". You can be SURE of meeting *your schedules* by joining the many leading architects, engineers and contractors who consistently specify WATERLOO for their finest churches, schools, hospitals, government and office buildings, commercial structures and homes.

We Can Expedite Your Emergency Orders Without Disrupting a Diversified Production Schedule. Prove it to Yourself by Specifying WATERLOO.

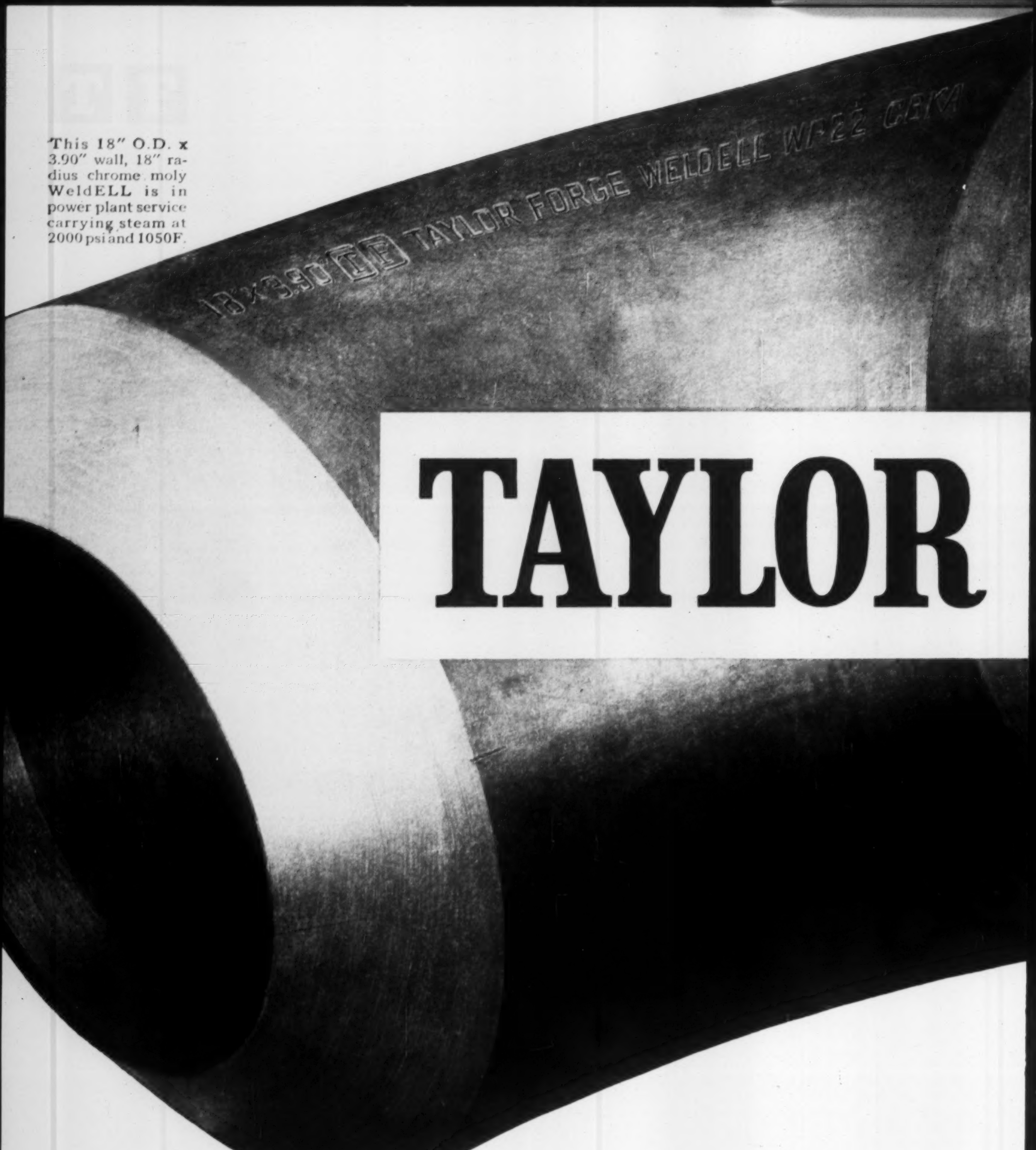
Plus

1. **WATERLOO Attractive APPEARANCE**
   Adds to the beauty of modern interiors. Provides custom-finished one-piece appearance, with beautiful beveled edge frames—and now finished in decor beige-gray.
2. **WATERLOO Efficient PERFORMANCE**
   Exclusive advanced louvre design assures perfect air control and smooth, quiet operation in every installation.
3. **WATERLOO Complete SELECTION**
   This one COMPLETE LINE of time-proven equipment, now improved with *new narrow stack depth*, meets all needs for modern air conditioning and heating installations in the commercial and home fields.

There is a Waterloo Representative in Your Local Area, Who Will be Happy to Answer Your Questions, Provide Size Selection Tables and Catalogs, — or Write us.

WATERLOO REGISTER CO., Inc.
P. O. BOX 72 WATERLOO, IOWA, U. S. A.

This 18" O.D. x 3.90" wall, 18" radius chrome moly WeldELL is in power plant service carrying steam at 2000 psi and 1050F.


18"x3.90 TF TAYLOR FORGE WELDELL WP22 CBKA

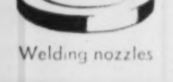
TAYLOR

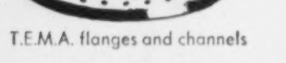
Welding nozzles

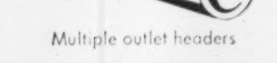
T.E.M.A. flanges and channels

Multiple outlet headers

Production forgings


Venturi reducers


Spiral weld pipe


Large diameter electric weld pipe

Welding necks

Traditionally Dependable

FORGE

Welding Fittings and Forged Flanges

Engineered for accuracy . . . forged for greatest strength and longest life . . . backed by the know-how that has come with 55 years of experience in the forming of metal products by hammering, rolling, extruding, drawing, pressing, welding—in fact, by every known basic metal working process.

That's why . . . by any standard of comparison . . . by any method of value analysis . . . you can't buy better products than those of TAYLOR FORGE.

For EVERYTHING in Welding Fittings and Forged Flanges . . . every type, size, thickness, pressure rating, material . . . turn to TAYLOR FORGE.

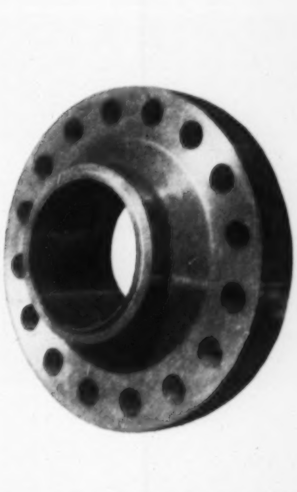
Taylor Forge & Pipe Works

General Offices and Works: P. O. Box 485, Chicago 90, Illinois

Plants at: Carnegie, Pa.; Gary, Ind.; Houston, Texas; Fontana, Calif.;
Hamilton, Ont., Canada
District Sales Offices: New York, Philadelphia, Pittsburgh, Atlanta, Chicago, Houston, Tulsa, Los Angeles, San Francisco, Toronto, Calgary.

There's a Taylor Forge Distributor near you

He carries a full stock of Taylor Forge Welding Fittings and Forged Steel Flanges and can supply your needs promptly. He's a good man to know for he's exceptionally well informed on the subject of piping and through him you have available the services of Taylor Forge engineers for help and advice on any piping problems.



RETURN
MON FLO
SUPPLY
MON FLO
B&G
MONOFLO
FITTINGS

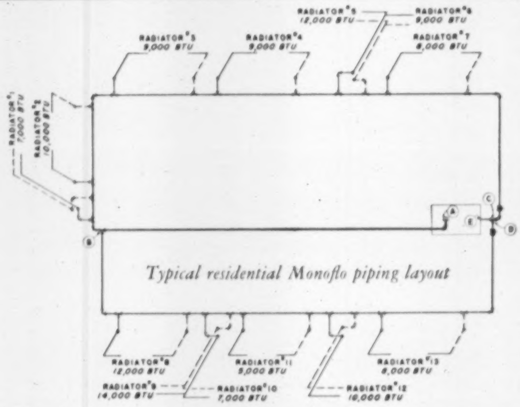
No Limits!

An exclusive feature of B&G Monoflo Fittings is that there is virtually no limit to the number which can be installed in any circuit of a one-pipe forced hot water heating system. Design problems which otherwise occur are eliminated.

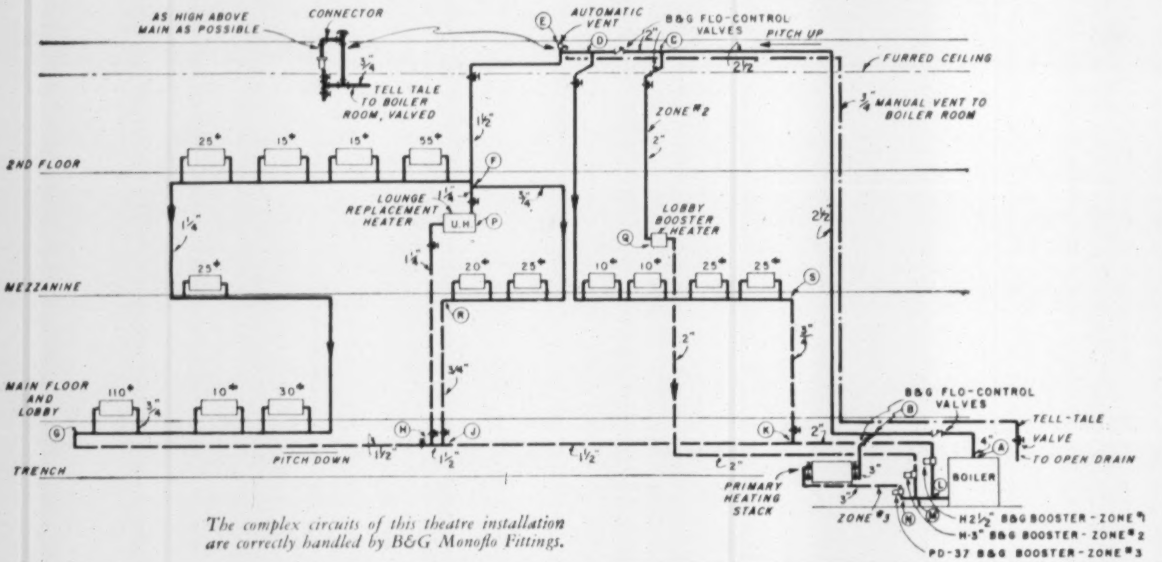
That's because these Fittings are scientifically engineered to diversion capacities best suited to system design. Extremely high resistance in a fitting restricts the number which can be installed in a circuit—and creates other disturbances which prevent efficient circulation.

By using one or two Monoflo Fittings, depending upon the size of the heating unit and its distance from the main, an accurately balanced system is achieved. (*In most instances, only one Fitting is required.*)

B&G Monoflo Fittings are made by a special machine which taps the threads with extreme accuracy. Installation is therefore always easy—no "cranking" of pipes.


RADIATOR #1 7,000 BTU
RADIATOR #2 10,000 BTU
RADIATOR #3 9,000 BTU
RADIATOR #4 9,000 BTU
RADIATOR #5 12,000 BTU
RADIATOR #6 9,000 BTU
RADIATOR #7 8,000 BTU
RADIATOR #8 12,000 BTU
RADIATOR #9 14,000 BTU
RADIATOR #10 7,000 BTU
RADIATOR #11 9,000 BTU
RADIATOR #12 10,000 BTU
RADIATOR #13 8,000 BTU
A
B
C
D
E

Typical residential Monoflo piping layout


AS HIGH ABOVE MAIN AS POSSIBLE
CONNECTOR
3/4"
TELL TALE TO BOILER ROOM, VALVED
AUTOMATIC VENT
B&G FLO-CONTROL VALVES
PITCH UP
2"
2½"
FURRED CEILING
3/4" MANUAL VENT TO BOILER ROOM
ZONE #2
2"
1½"
2ND FLOOR
25#
15#
15#
55#
LOUNGE REPLACEMENT HEATER
U.H
1¼"
3/4"
LOBBY BOOSTER HEATER
2½"
MEZZANINE
25#
20#
25#
10#
10#
25#
25#
3/4"
2"
3/4"
MAIN FLOOR AND LOBBY
110#
10#
30#
3/4"
PITCH DOWN
1½"
1½"
1½"
2"
2"
TRENCH
B&G FLO-CONTROL VALVES
TELL-TALE VALVE
TO OPEN DRAIN
4"
BOILER
3"
3"
PRIMARY HEATING STACK
ZONE #3
H 2½" B&G BOOSTER - ZONE #1
H-3" B&G BOOSTER - ZONE #2
PD-37 B&G BOOSTER - ZONE #3
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S

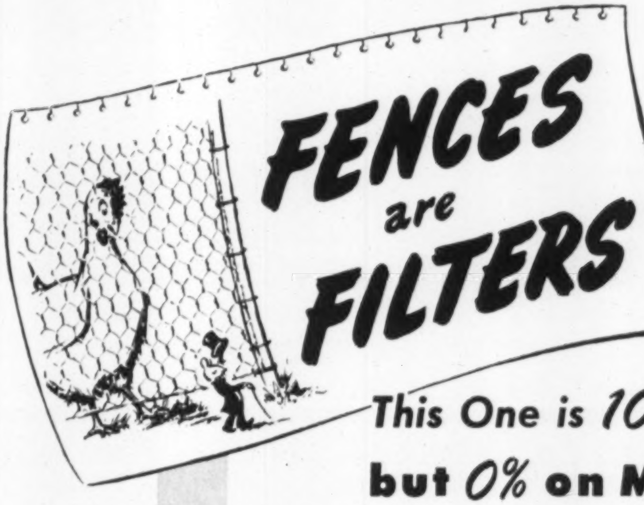
The complex circuits of this theatre installation are correctly handled by B&G Monoflo Fittings.

For complete description and design data on B&G Monoflo Fittings send for Bulletin DF-450

BELL & GOSSETT COMPANY

Dept EE-5, Morton Grove, Illinois

Canadian Licensee: S. A. Armstrong, Ltd., 1400 O'Connor Drive, W. Toronto



This One is *100%* Efficient on Chickens — but *0%* on Mice!

SO — when you compare filter efficiencies, use the same test

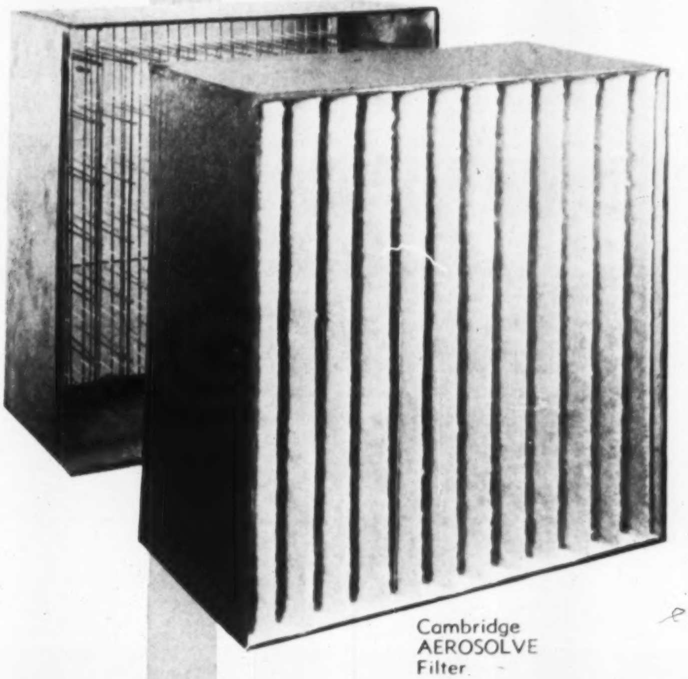
STANDARD TESTS — PERCENTAGE OF EFFICIENCY

TYPE FILTER	ASHAE (Weight Test)	NBS TEST # (Atmospheric Dust)	DOP TEST (0.3 Micron Smoke)
Cambridge Absolute	*	*	**99.95 Min.
Cambridge Aerosolve 95	*	90-95	80-85
Cambridge Aerosolve 85	99	80-85	50-60
Cambridge Aerosolve 35	96	30-35	20-30
Electric Precipitator	99	85-90	60-70
2" Cleanable	76	8-12	2-5
2" Throwaway	76	8-12	2-5

*Practically 100%. Test not practical for more accurate reading.

#National Bureau of Standards Discoloration Test.

**Maximum Allowable Penetration of Dioctyl Phthalate Smoke 0.05%. Every filter individually tested.



Cambridge AEROSOLVE Filter

Cambridge filters, used alone or with prefilters to take out the "chickens," give you high-efficiency air cleaning at only a fraction of previous costs. Wide range of efficiencies, from the Cambridge AEROSOLVE 35 to the world-famous Cambridge ABSOLUTE.

Cambridge AEROSOLVE Filters have a rugged permanent frame for long life. Light, compact cartridges, in a wide range of efficiencies, provide long service life and are easily replaced. No maintenance required.

Take advantage of Cambridge's unequalled experience in the field of high-efficiency air filtering. Ask the Cambridge man to help you lick your tough filtering problems.

Write for
AEROSOLVE Filter Bulletin 105A
ABSOLUTE Filter Bulletin 106A

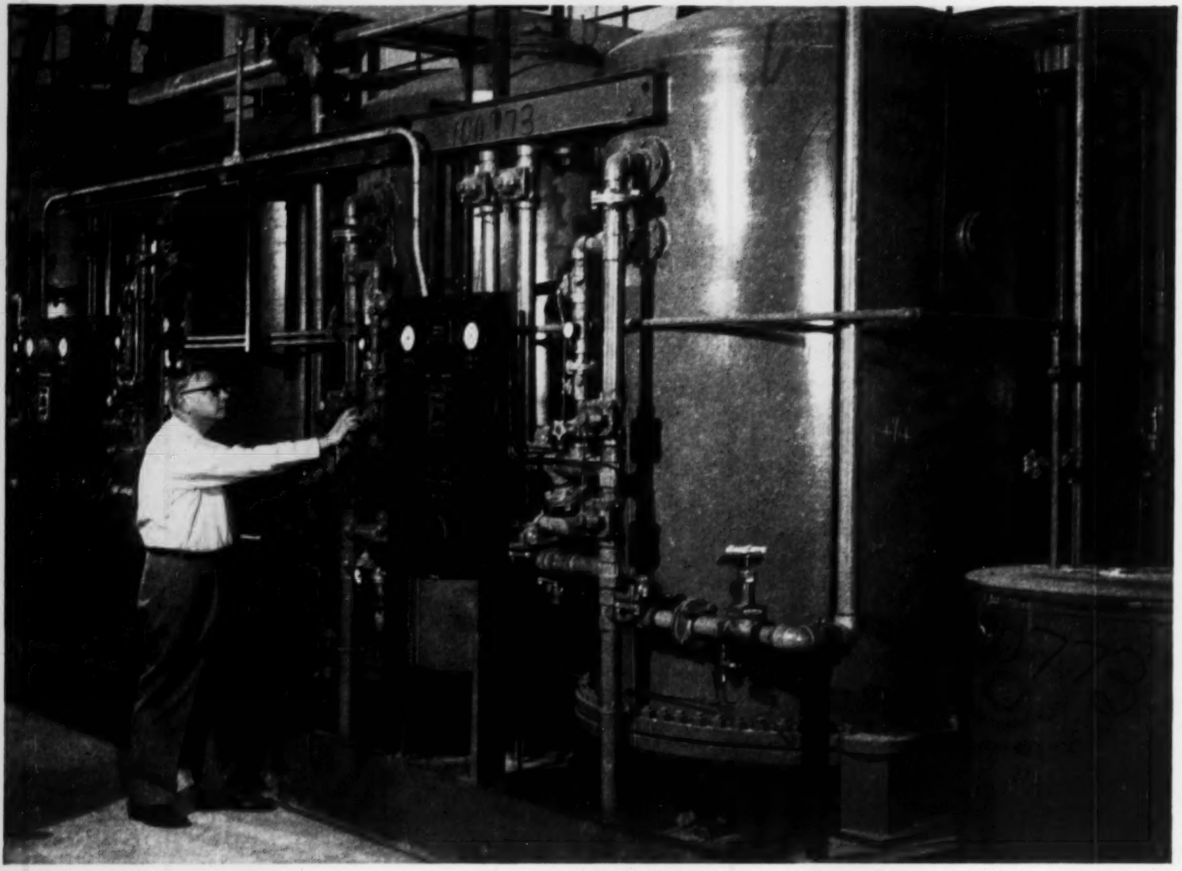
CAMBRIDGE FILTER CORP.

Pioneers in High-Efficiency Air Cleaning
734 E. Erie Blvd. Syracuse 3, N. Y.

Representatives in Principal Cities

Another new development using

B. F. Goodrich Chemical *raw materials*



B. F. Goodrich Chemical Company does not make this pipe. We supply only the Geon resin.

Pipe Dreams come true with Geon Rigid Vinyl!

If you've dreamed of cutting piping costs in half, listen to this: On a major piping installation, General Electric Appliance Park changed earlier planning and used pipe made from Geon rigid vinyl...results show a fine job at much lower cost.

This corrosion resistant Geon pipe carries deionized water at 300 psi in lines ¼" to 2". Fittings are made from Geon, too, by a new injection molding process that provides appreciably greater strength and dimensional accuracy.

Geon rigid vinyl piping costs much less, and in many cases proves more serviceable than high grade steel and alloys. It is light in weight, saves money in installation and change-overs. It resists acids, alkalis, oil and gas . . . has exceptionally high impact strength.

Geon polyvinyl materials make possible many economies and improvements, point the way to increased sales and profits. Geon materials are available in many forms for use in many products—upholstery, flooring, sponge, wire and cable insulation, and a host of others. To find how Geon can fit into your future, please write Dept. DN-1, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

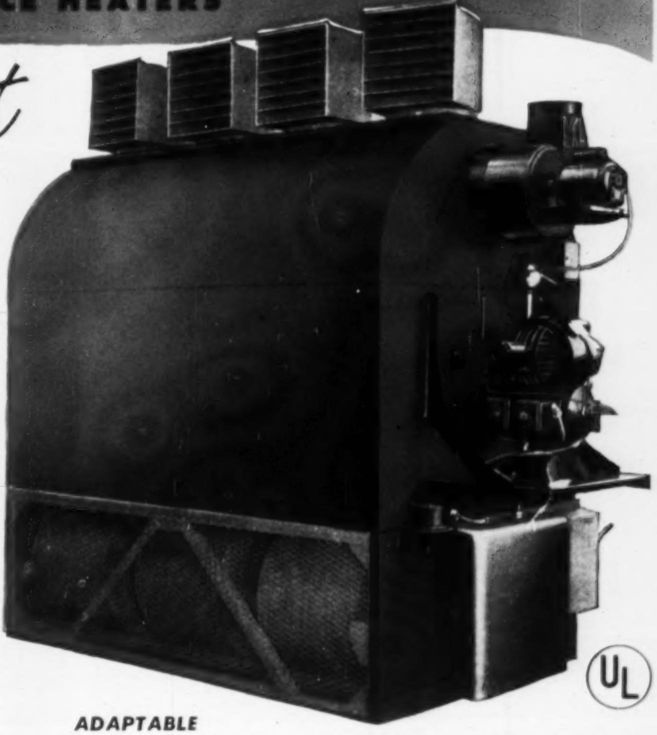
Geon
Polyvinyl Materials

GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.

GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

Commercial-Aire

DIRECT-FIRED SPACE HEATERS



A Modern Concept of

- Combustion Efficiency
- Air Engineering
- Control System Design
- Warm Air Versatility

SENSIBLY PRICED

EFFICIENT — Commercial-Aire direct-fired heaters offer a new high in efficiency. Recommended for heating of industrial, commercial and warehouse space. These heaters have a guaranteed combustion efficiency of 80%. Newly designed heat exchanger saves fuel. Oversize primary and secondary transfer surfaces stop heat losses. Separate induction draft blower purges combustion chamber. Delayed relay starts main burner only when heat exchanger is purged. Fan control starts main blower only when proper bonnet temperature is reached.

ECONOMICAL — Commercial-Aire direct-fired heaters burn fuel only when thermostats call for heat . . . no heat waste. Burners shut off when desired temperature is reached . . . no heat transmission loss. No fuel burned to maintain steam pressure or water temperature . . . no cold blast on start. High speed heat discharge maintains proper temperature at working level.

ADAPTABLE

TEN SIZES: From 300,000 to 2,000,000 B.T.U.'s at bonnet. A size for every job.

THREE FUELS: Commercial-Aire direct-fired furnaces burn heavy oil, light oil, gas and combinations of these fuels.

THREE POSITIONS: Each unit is of versatile construction and may be installed upright, horizontally suspended or inverted suspended. They are adaptable to direct space heating systems or duct distribution systems. Write for complete specifications and prices.

DEALERS
SEND FOR
FULL INFORMATION

MAMMOTH

VERTICAL STEEL TUBULAR HEATERS

Mammoth Vertical furnaces have been, for 30 years, widely used in churches, schools, factories, auditoriums and commercial buildings wherever duct-type heating is indicated. They deliver efficient, comfort heating with low fuel costs. Sizes from 208,000 to 2,379,000 B.T.U. output. Write for details.

MAMMOTH FURNACE COMPANY
509 Vandalia Street, St. Paul, Minnesota

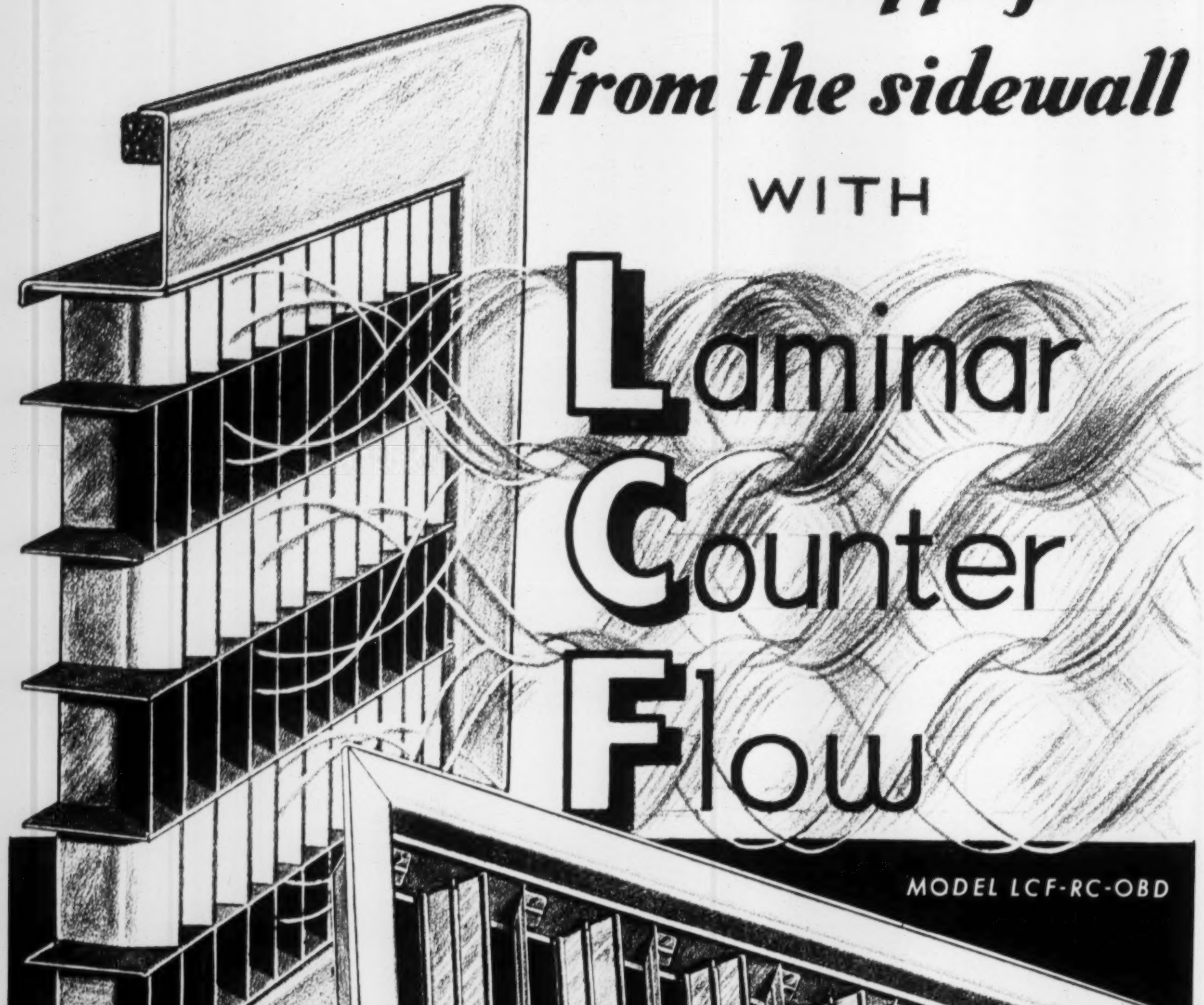
Gentlemen:
Please send promptly full information, prices, etc. on:
☐ COMMERCIAL-AIRE DIRECT-FIRED SPACE HEATERS
☐ MAMMOTH VERTICAL TUBULAR STEEL FURNACES

Your Name ____________________
Firm Name ____________________
Address ____________________
City ____________ Zone ______ State ____________

FOR BETTER AIR DISTRIBUTION

diffuse supply air
from the sidewall

WITH

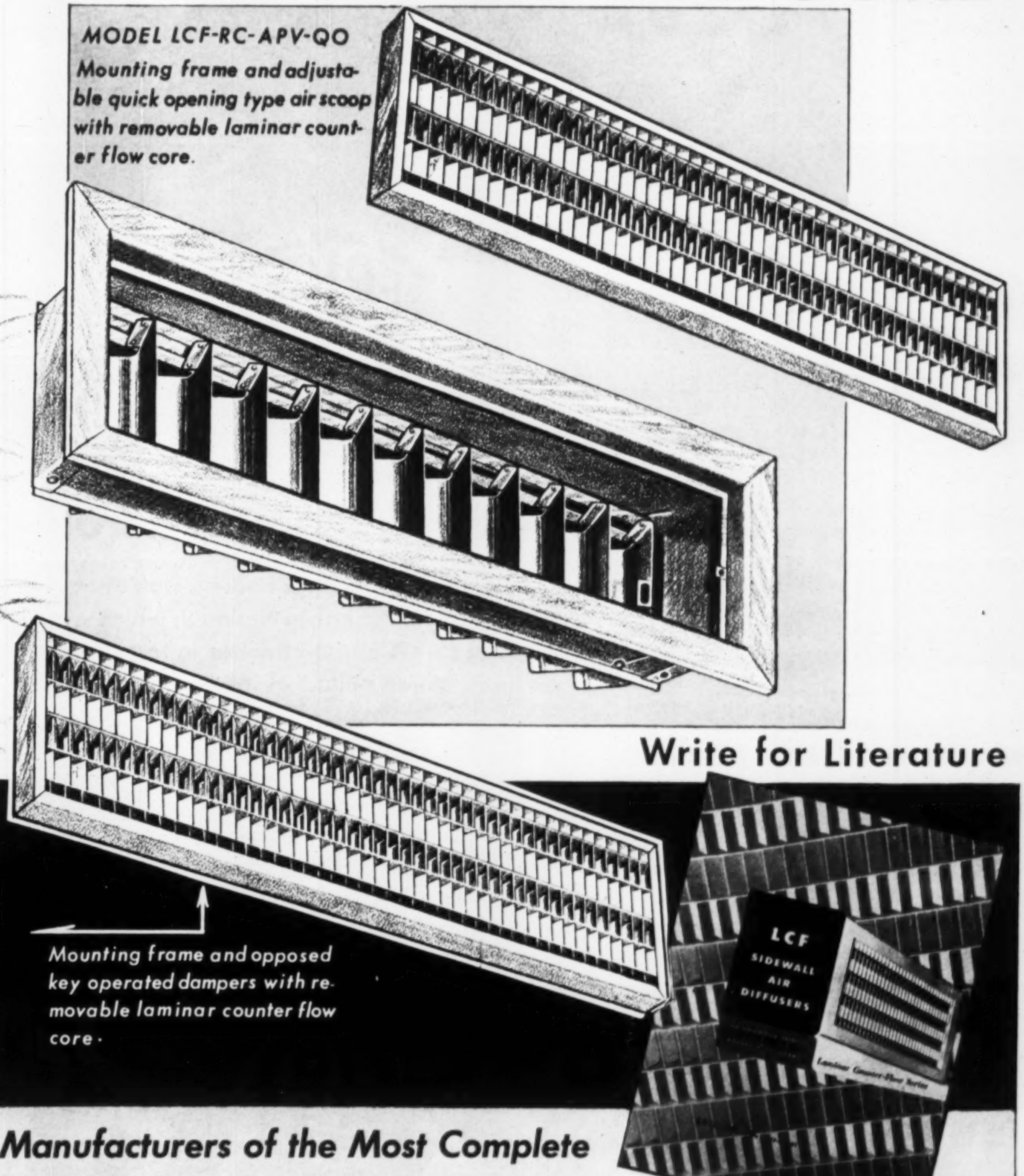


Laminar
Counter
Flow

MODEL LCF-RC-OBD

AIR-FACTORS INC 1624 SOUTH RAYMOND AVE.
MONROVIA, CALIFORNIA

NOW SERIES LCF DIFFUSERS with REMOVABLE CORE


LCF
SIDEWALL
AIR
DIFFUSERS
Laminar Counter-Flow Series

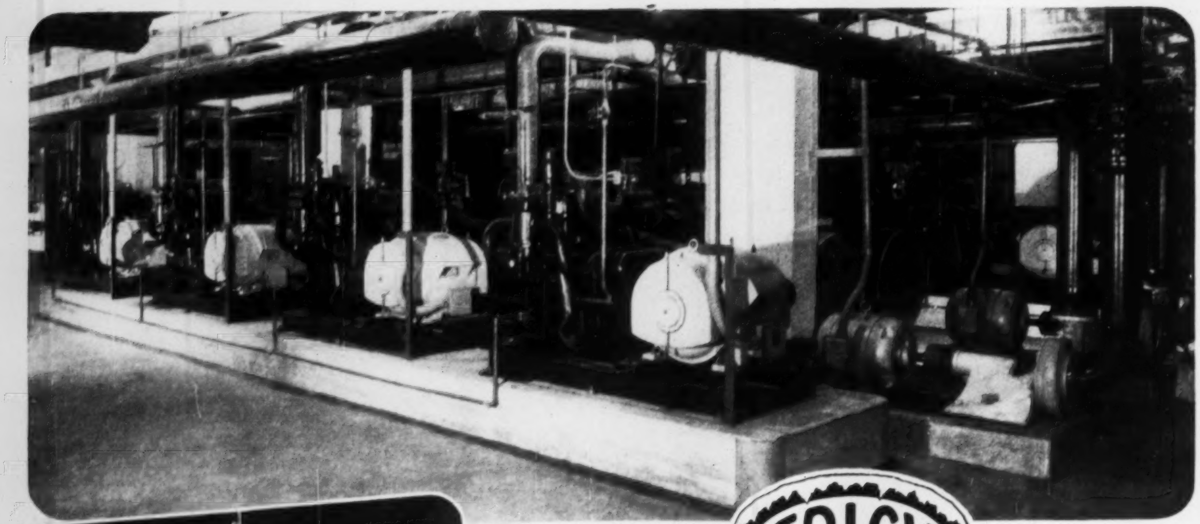
MODEL LCF-RC-APV-QO

Mounting frame and adjustable quick opening type air scoop with removable laminar counter flow core.

Write for Literature

Mounting frame and opposed key operated dampers with removable laminar counter flow core.

Manufacturers of the Most Complete Line of Air Distribution Equipment



The 11-story buildings of American National Insurance are kept cool and comfortable by eight Frick "ECLIPSE" compressors, shown above with condensers, water coolers, pumps and other auxiliaries. . . . There are "ECLIPSE" compressors to handle any load, with any refrigerant, at any temperature.

TRADE FRICK MARK®

Air Conditioning

SERVES AMERICAN NATIONAL INSURANCE CO., GALVESTON

These handsome buildings house a staff of over 1000 people for American National, which was organized in 1905 and now has in force more than three billion dollars of insurance.

Both buildings were recently air conditioned completely by Decker and Roberts, Frick Distributors in Fort Worth, using among other things eight "ECLIPSE" refrigerating machines. These compressors have the exclusive Frick nine-cylinder design.

Fine buildings require fine equipment. You get the ultimate in air conditioning and refrigerating machinery when you specify "FRICK." Write for estimates and Bulletin 100 today.

DEPENDABLE REFRIGERATION SINCE 1882

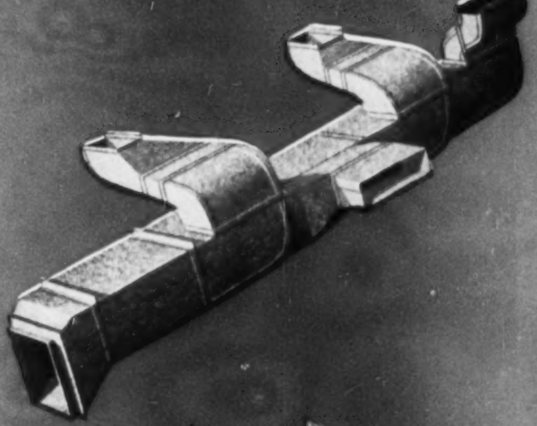
FRICK Co.

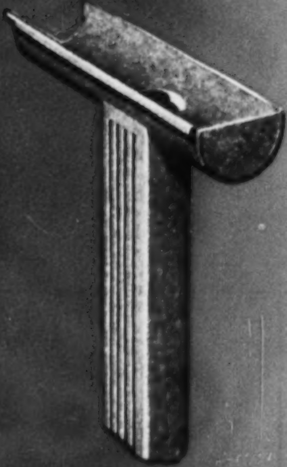
WAYNESBORO, PENNA. U.S.A.

There's built-in durability in

WEIRKOTE

for all sheet-metal work

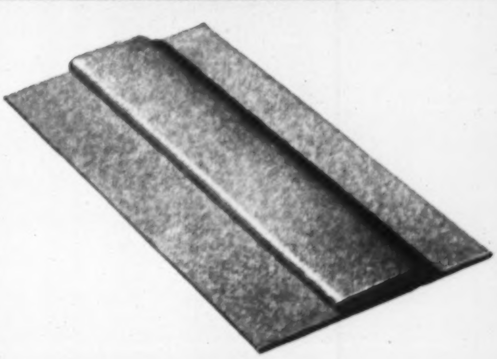




Wherever a durable zinc-coated material is needed for sheet metal fabrication, there's nothing better than Weirkote. Gutters, downspouts, ducts—no matter what the application, the name Weirkote on galvanized steel means uniformly high quality steel, tightly coated with zinc to resist cracking, peeling, flaking and corrosion. The high quality is assured by Weirton's modern mills and methods—and men.

When your specifications call for galvanized steel, call Weirton, and be sure.

Weirkote is available in coils and cut lengths: gauges 16 to 30 inclusive. Maximum width—42″, maximum cut length—168″. Weirkote can be obtained to fit any customer requirement. For standard roofing and siding it is guaranteed to conform to A.S.T.M. specification A361-52T.



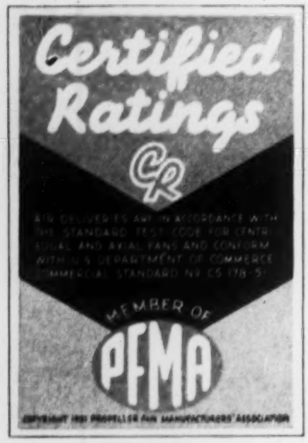
PITTSBURGH LOCK

WEIRTON STEEL COMPANY

Weirton, West Virginia

NATIONAL STEEL CORPORATION

THE GUESSWORK IS GONE FROM ROOF VENTILATOR OUTPUT!


Certified Ratings
CR
AIR DELIVERIES ARE IN ACCORDANCE WITH THE STANDARD TEST CODE FOR CENTRIFUGAL AND AXIAL FANS AND CONFORM WITH U.S. DEPARTMENT OF COMMERCE COMMERCIAL STANDARD No CS 178-51
MEMBER OF
PFMA
COPYRIGHT 1951 PROPELLER FAN MANUFACTURERS' ASSOCIATION

***Power Fan Manufacturers Association is an organization of leading manufacturers of air moving devices to establish standard methods of testing fan performance and sound, and to insure that this information is correctly presented to the public.**

. . . if you specify this label

Now you can be sure that published roof ventilator output ratings conform with actual ratings . . . if you specify the P.F.M.A.* label! This label is your guarantee that the ventilator displaying it has been tested for output according to the standard code for centrifugal and axial fans by an impartial laboratory . . . and is in accordance with U.S. Department of Commerce commercial standards. For accurate and dependable ratings . . . be sure you specify . . . and get . . . ventilators with the P.F.M.A. label.

and you'll find it on CARNES ventilators

MODEL CL

Modern, low-countour roof ventilator. Heavy gauge aluminum housing in attractive aluminum finish that maintains a neat appearance. Heavy duty ball-bearing motors, mounted on full floating rubber vibration isolators for exceptionally quiet, smooth operation. Backwordly inclined, non-overloading centrifugal fans . . . expertly made and precision-balanced on the finest balancing equipment to provide highest capacity. Available in a wide range of sizes for the requirements of any building.

MODEL J

A new Carnes roof ventilator that combines low, streamlined construction and maximum efficiency. All aluminum spun housings that eliminate corrosion and maintenance problems are standard on all Model J Roof Ventilators. Freedom from noise and vibration is accomplished through the use of specially designed vibration isolators. This, high efficiency roof ventilator is available in sizes from 24" through 48" centrifugal fan wheels.

For Complete Information, Write

CARNES CORPORATION

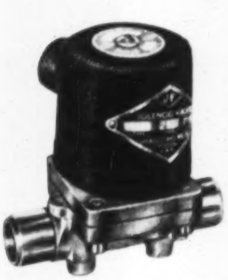
VERONA, WISCONSIN

Thousands of J-E Solenoid Valves... Installed in America's "Miracle Community" – Levittown, Pa.

The new Levitt "Jubilee" Home features "zoned heating" controlled by one thermostat downstairs and one upstairs. Hot water circulation for radiant heating and forced air convectors is controlled by dependable J-E Solenoid Valves.

Specifications are carefully considered on a mammoth project like Levittown, Pa., where a community of 17,000 homes is being created for a population of 70,000. It is significant that J-E Solenoid Valves were selected for installation on the modern "zoned heat" hot water circulating systems in thousands of these homes.

Among the reasons why are:



QUIET OPERATION—no mechanical linkage or impact action.

DEPENDABILITY—No metal-to-metal contact to wear—no close tolerances. Tight closing resilient seats.

MAINTENANCE FREE—only two moving parts—flexible diaphragm eliminates clogging—minimum temperature rise assures cool coils, long life.

...for lasting customer satisfaction

For complete information on the wide range of sizes available in the newly improved line of J-E Solenoid Valves, for heating, cooling, refrigeration or air conditioning, call your wholesaler or write direct today.

LOOK FOR THE RED DIAMOND J-E SOLENOID VALVES

JACKES-EVANS MANUFACTURING COMPANY

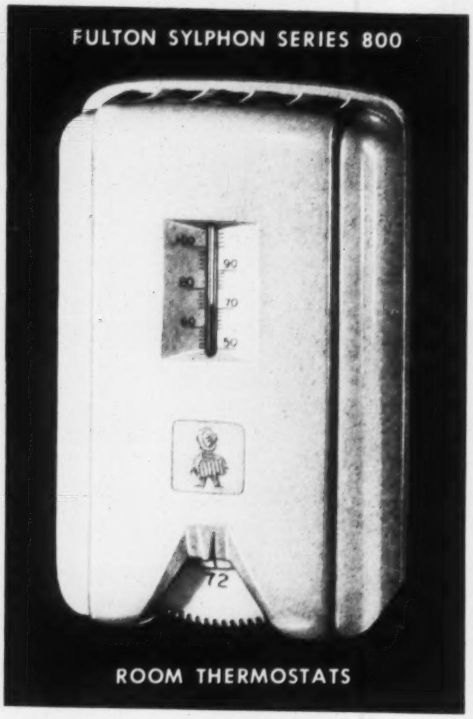
Controls Division: 4427 Geraldine Avenue • St. Louis 15, Missouri

FEATURE FOR FEATURE...

HERE'S YOUR BEST THERMOSTAT

for all types of heating and air conditioning

FULTON SYLPHON SERIES 800



ROOM THERMOSTATS

SENSITIVE
No. 801 series has sensitivity of ± ½° F. and No. 802 series has sensitivity of ±1° F.

POSITIVE-ACTION SWITCH
Snap action switch provides for positive open and closed position of switch contacts. Arcing, contact burning and "welding" are minimized.

HEAVY DUTY TYPE
Line voltage type for heavy duty, 20 amp, 125/250 volts AC, ¾ HP at 115 VAC and 1½ HP at 230 VAC.

ACCURATELY CALIBRATED
Dial is accurately calibrated for precise, quick setting of the thermostat.

QUICK-MOUNTING
Mounts on standard 2" x 3" outlet box with only 2 screws; cover need not be removed for mounting.

QUICK RESPONSE
Vapor pressure type thermal element—has large surface-area-to-mass ratio for quick sensing of temperature changes.

18 MONTH GUARANTEE
U. L. approved. Guaranteed for 18 months against defective workmanship or materials.

THREE TYPES
Series 800 Thermostats include types for heating, cooling and combination heating and cooling.

RUGGED CONSTRUCTION
Rugged design provides for years of trouble-free operation.

SAFETY SHOCK-PROOF COVER
Urea plastic is used for cover and dial to provide maximum safety against electrical shock hazards.

The practical features of Fulton Sylphon Room Thermostats, give you new, higher degree of accuracy, sensitivity, and dependability at regular thermostat prices. Extending only 1⁷⁄₁₆" from the wall, the handsome case is appropriate to any type heating or air conditioning installation.

FROM FULTON SYLPHON TEMPERATURE REGULATOR HEADQUARTERS, U.S.A.

Mr. Controls

Robertshaw-Fulton
CONTROLS COMPANY
FULTON SYLPHON DIVISION

FULTON SYLPHON DIVISION, Robertshaw-Fulton Controls Co.
Knoxville 1, Tennessee
Send me descriptive literature on Series 800 Room Thermostats:

Name________________________________

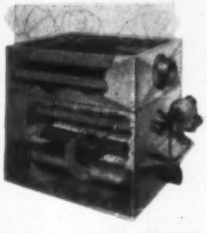
Company______________________________

Address______________________________

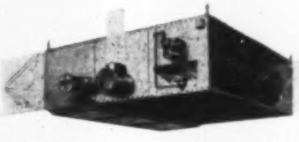
City____________________ State__________

Specify CAMPBELL HEATERS FOR BIG WARM AIR JOBS

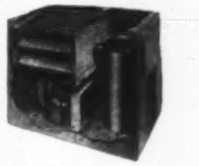
For easy installation, exceptional fuel economy and long, dependable service, specify Campbell. We will be glad to assist you on any large heating installation. Send us your preliminary plans and ideas and we will help you work them out.



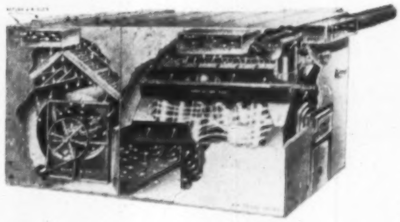
HI-BOY UNIT HEATER



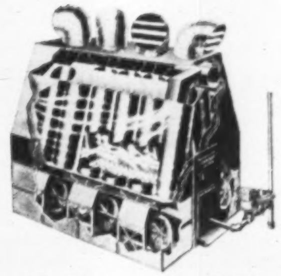
HORIZONTAL UNIT HEATER



LO-BOY HEATER



8000 SERIES HEATER



8000 SERIES UNIT HEATER

SPECIFICATIONS and DIMENSIONS

HEATER				BLOWER‡			MAX. FUEL RATE§				DIMENSIONS		
Unit No. *	Output Capacity BTU/Hr. †	Heating Surface Sq Ft	Btu per Sq Ft Heating Surface	Normal cfm 135° Dischg. Temp.	Assumed External Static In. Water	Motor hp	Oil gph	1000 Btu Gas cfh	LP Gas gph	Coal Lbs Per Hr.	H in.	L in.	W in.
Hi Boy & Horizontal Unit Heater—Oil & Gas for Churches, Schools, Commerical & Industrial Buildings													
HU200	200,000	83	2410	2600	½	½	1.8	250	2.5		66	48	23
HU250	250,000	83	3000	3300	½	¾	2.2	312	3.1		66	48	23
HU300	300,000	119	2520	4000	½	¾	2.7	375	3.8		72	54	29
HU350	350,000	119	2930	4600	½	1	3.1	437	4.4		72	54	29
HU400	400,000	180	2220	5300	½	1	3.6	500	5.0		84	60	34
HU500	500,000	180	2780	6600	½	1½	4.5	625	6.3		84	60	34
HU600	600,000	244	2460	8000	½	2	5.4	750	7.5		99	78	40
HU700	700,000	244	2870	9200	½	2	6.3	875	8.8		99	78	40
HU850	850,000	333	2540	11000	½	3	7.6	1060	10.6		108	106	48
HU1000	1,000,000	333	3000	13000	½	3	9.0	1250	12.5		108	106	48
Lo Boy Oil & Gas Fired for Large Residences, Small Churches, Schools, etc.													
H200	200,000	100	2000	2600	½	½	1.8	250	2.5		52	75	41
H250	250,000	125	2000	3300	½	¾	2.2	312	3.1		57	85	41
H300	300,000	136	2200	4000	½	¾	2.7	375	3.8		61	87	50
H350	350,000	152	2300	4600	½	1	3.1	437	4.4		61	87	50
H400	400,000	167	2400	5300	½	1½	3.6	500	5.0		61	87	50
H500	500,000	200	2500	6600	½	1½	4.5	625	6.3		74	91	60
H600	600,000	240	2500	8000	½	2	5.4	750	7.5		76	97	60
H700	700,000	280	2500	9200	½	2	6.3	875	8.8		72	104	80
8000 Series Oil, Gas, Stoker or Hand Fired For Large Schools, Churches, etc.													
8075	840,000	280	3000	11,000	¾	3	7.5	1050	10.5	100	93	134	76
8100	960,000	320	3000	12,500	¾	3	8.6	1200	12.0	114	95	153	76
8125	1,080,000	360	3000	14,100	¾	3	9.7	1350	13.5	129	97	171	76
8150	1,320,000	440	3000	17,300	¾	5	11.8	1650	16.5	157	98	195	76
8175	1,440,000	480	3000	18,900	¾	5	12.9	1800	18.0	171	99	202	76
8200	1,800,000	600	3000	23,600	¾	5	16.1	2250	22.5	214	120	216	94
8250	2,250,000	750	3000	29,500	¾	7½	20.1	2810	28.0	268	120	243	94
8300	2,700,000	900	3000	35,400	¾	7½	24.1	3380	33.8	320	132	251	104
8350	3,150,000	1050	3000	41,300	¾	10	26.1	3940	39.4	375	150	251	114
8000 Series Unit Heater—Oil, Gas, Stoker or Hand Fired—For Large Industrial Buildings													
U8125	1,080,000	360	3000	14,100	Consult our Engineers if duct system is to be used.	2-1	9.7	1350	13.5	129	97	105	76
U8150	1,320,000	440	3000	17,300		2-1½	11.8	1650	16.5	157	98	118	76
U8175	1,440,000	480	3000	18,900		2-1½	12.9	1800	18.0	171	99	130	76
U8200	1,800,000	600	3000	23,600		2-2	16.1	2250	22.5	214	120	137	94
U8250	2,250,000	750	3000	29,500		2-3	20.1	2800	28.0	268	120	157	94
U8300	2,700,000	900	3000	35,400		2-3	24.1	3380	33.8	320	132	157	104
U8350	3,150,000	1050	3000	41,300		2-5	26.1	3940	39.4	375	150	157	144

* Type A units include Special Oil or Gas Heater, Casing, Blower, Motor, Drive, Filters, Humidifier, and Blower Control but less Burner, Controls and Built-in Combustion Chamber.
Type B units include same as Type A plus Oil or Gas Burner and built-in Combustion Chamber and Standard Controls.

† Based on 80% thermal efficiency for oil and gas and 70% for coal. Add 10% to 35% over calculated heat loss for pick-up load and 10% to 15% for duct radiation losses. The higher figure is preferable for best operating economy and life of the equipment.

‡ For other air volumes and static pressures consult our Engineering Department.

§ An induced draft blower can be furnished if a stack or chimney is not available. The gas passages of the heaters are adequate so an inducted draft blower is not ordinarily needed.

For Complete Specifications, See *Sweet's Catalog Service*

CAMPBELL HEATING COMPANY

Des Moines 17, Iowa

CONTINENTAL has a "round-the-world" reputation for trouble-free air filtration

SELF-CLEANING AUTOMATICS

Patented media design and unique "soak-then-flush" action provide thorough self-cleaning. Ferris-wheel feature eliminates reversing media to direction of air flow in back curtain—no dust can be blown back into clean air stream.

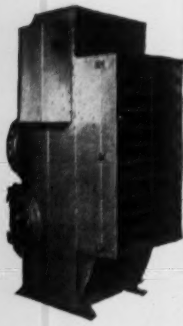
CA-24 DYCON

Oil-free, synthetic fiber media of this deep-bed (8") unit filter effectively traps and holds dust by accumulated static charge. Large dust-holding capacity. Choice of various media blankets to provide degree of efficiency desired. Easily rinsed for re-use—cuts maintenance costs.

E-Z Oil
Air Filter Oil

E-Z-OIL AEROSOL BOMB

For simple finger-tip re-oiling of viscous-type unit filters after washing.



HEAVY DUTY ENGINE AIR INTAKES

All advantages of Continental's Self-Cleaning Automatics assure maximum protection with minimum maintenance cost and effort.

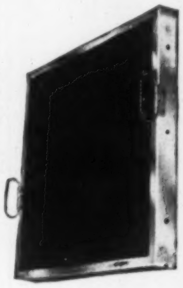
AIR
CONTINENTAL
FILTERS

E-Z-WASH UNIT FILTERS

Continental's patented media assures high efficiency, easy washing, freedom from clogging, and exceptional dust-holding capacity.

TYPE DY DYCON

Permanent 1" synthetic fiber filter in rust-proof aluminum frame easily rinses clean under open water faucet or nozzleless hose. Exceptional dust-holding capacity means infrequent servicing. Made in any desired size.

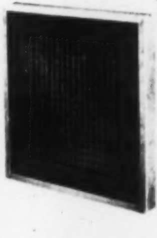


E-Z-WASH GREASE FILTERS

All aluminum highly efficient, permanent-type filters for kitchen exhaust systems. Easily washed—once through an automatic dishwasher and they are like new again.

CA-20 DYCON

Oil-free, synthetic fiber media of this deep-bed (4") unit filter effectively traps and holds dust by accumulated static charge. Large dust-holding capacity. Choice of various media blankets to provide degree of efficiency desired. Easily rinsed for re-use—cuts maintenance costs.



TYPE LV SCREEN WIRE

Graduated mesh-sizes in this formed screen wire filter add efficiency and dust-holding capacity. Viscous impingement, low velocity type. Available in 2- or 4-inch thickness, all standard sizes. Special sizes on order.

WRITE for catalogs, estimates . . . or contact the CONTINENTAL Sales Representative in your city.

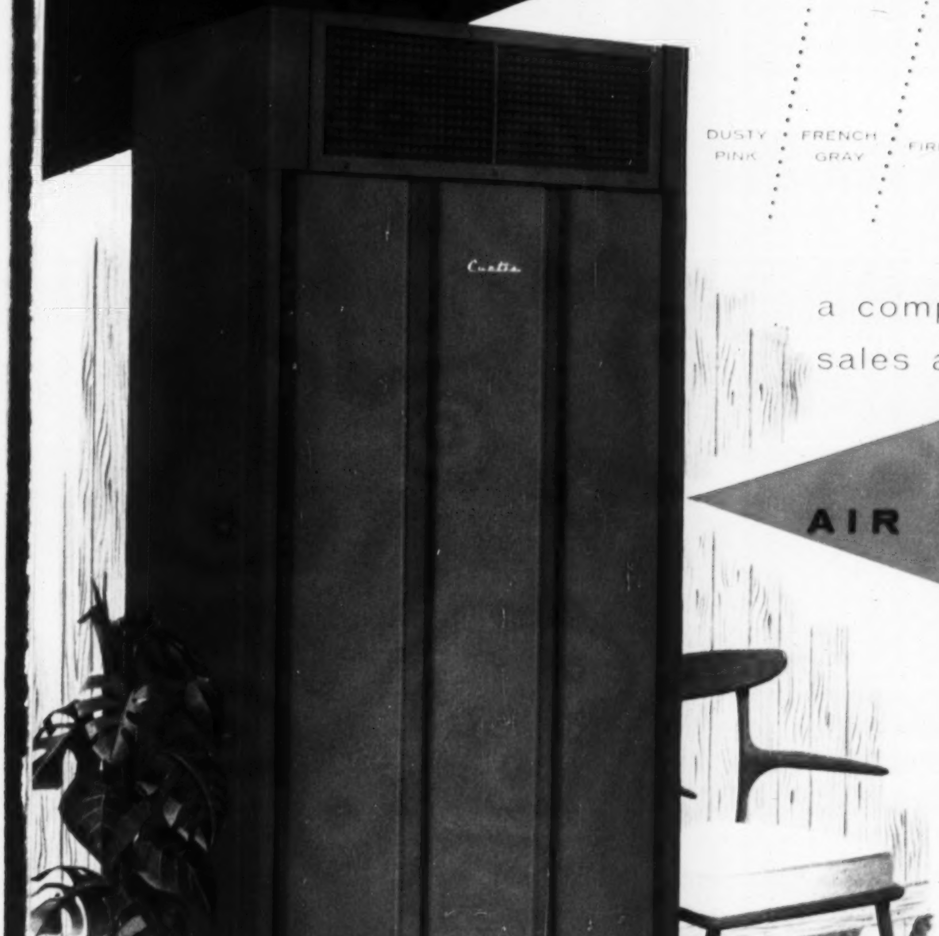
CONTINENTAL AIR FILTERS, Inc.

P. O. BOX 1647
•
LOUISVILLE 1
KENTUCKY

NOW profit comes in colors

DUSTY PINK · FRENCH GRAY · FIRNMIST · COLONY BLUE · SANDALWOOD · POTTERY BLUE

as shown in illustration



a completely **NEW** sales appeal in

Curtis AIR CONDITIONING UNITS

It's a Curtis exclusive!

For the first time Curtis packaged air conditioning units in a rainbow of cool restful colors baked on at the factory. Dealers everywhere will welcome this sales plus because:

1. The modern trend is to colors in appliances of all kinds. Now you have it in Curtis packaged air conditioning.

2. Combinations of colors are available to complement any decorative pattern your customer may desire!

3. A whole new field is opened to you with these new colorful Curtis units that cool and add beauty to any interior.

and ONLY Curtis has it!

Remember, you can count on

Curtis

MANUFACTURING COMPANY
Refrigeration Division
1982 KIENLEN AVE. · ST. LOUIS 20, MO.

CURTIS PACKAGED AIR CONDITIONING UNITS—SPECIFICATIONS

CABINET

Constructed of heavy gauge steel with an attractive baked finish that can be furnished in various color combinations as selected by customer.

HUMIDITY CONTROL

All units are furnished with a by-pass damper.

INSULATION

The interior is entirely insulated with approved type of heavy insulating and sound-absorbing material. This prevents exterior sweating and insures quietness.

COMPRESSOR—COMPRESSOR MOTOR

Hermetic and semi-hermetic type for F-22.

CONDENSER—RECEIVER

Shell and coil type with Lo-Fin copper tubes. Extra large capacity, low pressure drop, for either city water or cooling tower. A.S.M.E. condenser (with liquid level gauge assembly connections) standard. A fusible safety union standard on all models.

MAGNETIC MOTOR STARTER

Across-the-line magnetic motor starter provided with thermal overload protection.

FILTERS

Standard throw-a-way type.

COOLING COIL

Properly sized, balanced with the condensing unit. Copper tube and aluminum fin construction, mechanically and thermally bonded for highest heat transfer. Tubes are staggered and headered for maximum efficiency.

CONTROL

An automatic thermostat and a three position selector switch is built into the unit and is adjustable from the exterior of the cabinet. The fan may be operated separately for ventilation when cooling is not required. High pressure cutout-control is regular equipment. (Cutout pressure for F-22 is 350 PSI.) Note: On Model Series 15 & 20, selector switch controls No. 1 compressor; thermostat controls No. 2 compressor.

OPTIONAL EQUIPMENT

The following is available when specified.

PLENUM AND GRILLE ASSEMBLY

When duct work is not necessary the plenum and grille assembly is available as an extra. The discharge grille is adjustable in two directions.

WATER REGULATING VALVE

For use with city water supply. Valve is not attached.

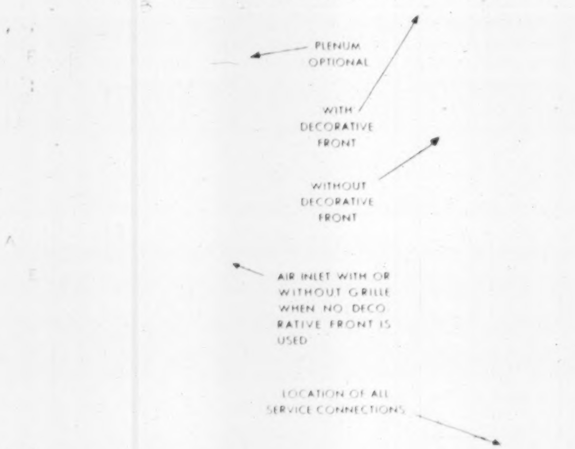
HEATING COIL

When specified, one or two row heating coil, hot water, steam, or steam distributing tube type can be provided for field installation.

COOLING COIL

For special applications, additional rows can be furnished, when heating coil is not used.

All specifications subject to change without notice.


PLENUM OPTIONAL
WITH DECORATIVE FRONT
WITHOUT DECORATIVE FRONT
AIR INLET WITH OR WITHOUT GRILLE WHEN NO DECORATIVE FRONT IS USED
LOCATION OF ALL SERVICE CONNECTIONS

MODEL	COMPRESSOR	CFM	NO. OF BLOWERS	DIMENSIONS A	B	C	D	E	F
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	24	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	4000	2	[illegible]	[illegible]	24	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	8000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

SEE YOUR CURTIS REPRESENTATIVE

OR

WRITE

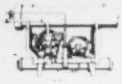
Curtis

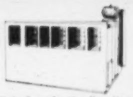
102 YEARS OF MANUFACTURING EXPERIENCE

MANUFACTURING CO.
Refrigeration Division
1982 Kienlen Ave. • St. Louis 20, Mo.

Condensing Units Up to 100 Tons

Cooling Towers Up to 100 Tons


Packaged Liquid Chillers Up to 100 Tons


Multi-Zone Air Handling Units Up to 75 Tons

Condensing Units Air Cooled Commercial Residential

The MASSACHUSETTS *Line*®

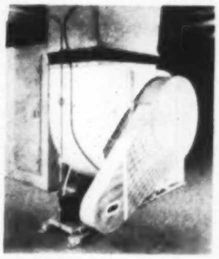
Another ENGINEERING *Achievement!*

Where a variety of fan equipment of high standards is required, Massachusetts Fans are the ultimate choice. Shown below are some of the installations in the fan and control room of the A. B. Dick Co. which has been air conditioned and ventilated with Massachusetts fans.

RESEARCH AND ENGINEERING BUILDING
A. B. DICK COMPANY
NILES, ILLINOIS

Architect, Engineer and Contractor:
Ragnar Benson Inc.

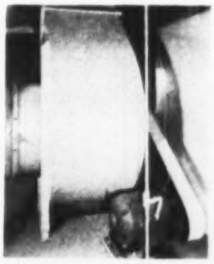
Air Cond. Contractor: O. A. Wendt Co.



Size #3½ S. C. Fan SISW, Arr. #3. 20,000 CFM at 1½" S.P. 10 H.P. Motor.

Size #5 S.C. Fan SISW Arr. #3 With Inlet vanes. 44,490 CFM at 2½" S.P. 30 H.P. Motor.

General view of fan room, Also showing size 3½ S.C. Fan



Size #3½ S.C. Fan SISW Arr. #3. With Inlet Vanes. 32,200 CFM at 1½" S.P. 15 H.P. Motor.

Utility Set Size MSV 12 C 1500 CFM at 1" S.P. Driven by a ½ H.P. Motor.

Size #3½ S.C. Fan. 29,600 CFM at 1½" S.P. 15 H.P. Motor and MSV 11½C, 1260 CFM, 1" S.P. ½ H.P. Motor.

MASSACHUSETTS BLOWER DIVISION

The BISHOP & BABCOCK Mfg. Co.

4901 HAMILTON AVENUE • CLEVELAND 14, OHIO

Brundage . . . blowers since 1919

WRITE FOR LITERATURE
PRICES ON REQUEST
RELIABLE SERVICE—
WHEN YOU NEED IT!

Customers say it so much better

"For the past six years I have been dealing with various manufacturers and suppliers and I can truthfully say that I have never had such co-operation and genuine desire to give the very best of service as I have enjoyed from your company personnel."

— — —

After 36 years in the blower business, we are expected to provide the best in air handling equipment. But, it's service to every customer, large or small, that keeps us growing.

That's why we appreciate hearing things like this from our customers. It lets us know that Brundage service is up to the standards we strive for.

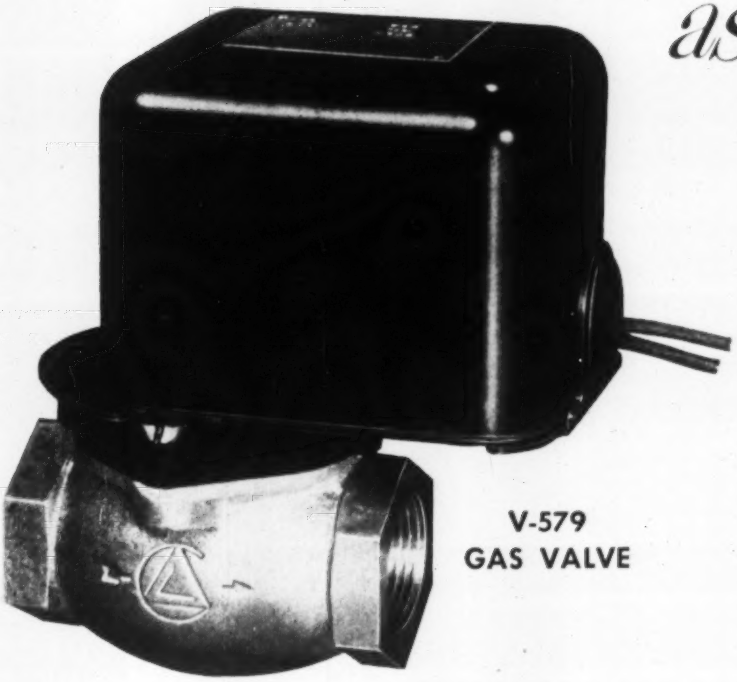
We'd like an opportunity to serve you in the same way.

THE Brundage COMPANY

512 N. PARK ST. **KALAMAZOO, MICH.**

PHONE 2-0251

quiet as a flame!



V-579 GAS VALVE

You'll have– MORE SATISFIED CUSTOMERS . . . MORE PROFITS

with V-579 Gas Valves by DETROIT CONTROLS. No click, no hum, no noise because the V-579 is operated by positive opening, positive closing "Biflex" motor!

Install these V-579 gas valves close to living rooms or sleeping rooms, secure in the knowledge that they will operate dependably and *quietly*. Their operation is independent of gas pressure and gravity. Ideal for *all* types of gas, in any domestic heating unit! ½ inch to 1¼ inch sizes.

Talk to your Detroit Controls Wholesaler *Today* . . . or write for Bulletin 229.

ACCEPTED BY ALL UTILITIES

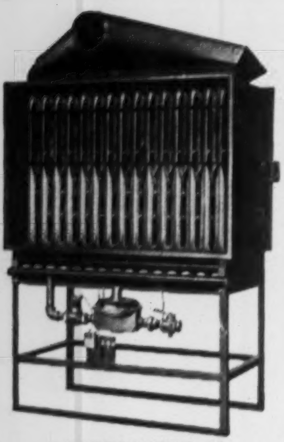
DETROIT CONTROLS CORP. manufactures a complete line for the air conditioning and refrigeration industries as well as heating.

DETROIT CONTROLS CORPORATION
5900 TRUMBULL AVE. • DETROIT 8, MICHIGAN
Division of AMERICAN RADIATOR & STANDARD SANITARY Corporation

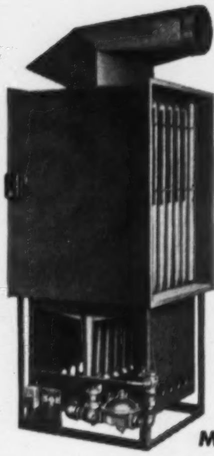
Representatives in Principal Cities • Canadian Representatives:
RAILWAY AND ENGINEERING SPECIALTIES, LTD.,
Montreal, Toronto, Winnipeg.

AUTOMATIC CONTROLS for REFRIGERATION

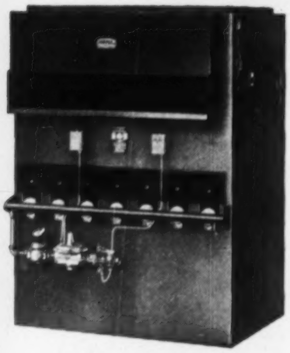
AIR CONDITIONING • DOMESTIC HEATING • AVIATION • TRANSPORTATION • HOME APPLIANCES • INDUSTRIAL USES



MODEL SED-E



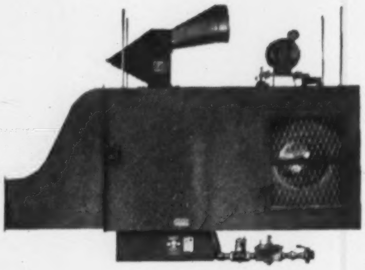
MODEL SED-S



MODEL SED-VF

MODEL SED-E — Non-corrosive type 321 stainless steel heat exchanger. Permits installation downstream of cooling equipment, for continuous blower operation. Air throughput in either direction. 80,000 to 600,000 Btu input.

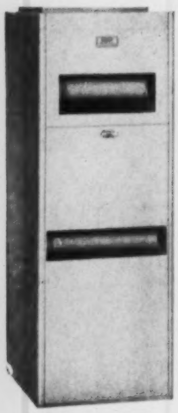
MODEL SED-S — Same as SED-E except controls are at the side, instead of at the end where accessibility requires either SED-E or SED-S is available in sizes from 80,000 to 600,000 Btu input in increments of 40,000 Btu.



MODEL SEU

MODEL SED-VF — Tested and approved as a duct furnace; type 321 stainless steel. Re-circulated or fresh air enters through bottom, sides, or back. Built-in air bypass, vent in front. Sizes from 70,000 to 245,000 Btu input.

MODEL SEU — Suspended unit heater. Recirculates room air. Diffuser outlet with adjustable vertical and horizontal vanes. Double inlet forward curve blower. Continuous duty, variable pitch drives, raised port burners. 80,000 to 600,000 Btu input.



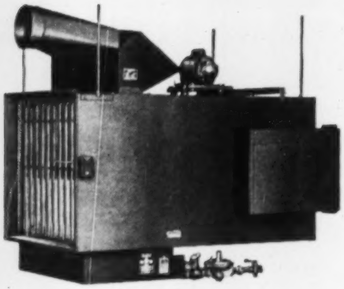
MODEL SEC

HAYES

FURNACES

outstanding for
commercial, industrial,
schools, churches,
theaters, large residential

HAYES FURNACE MFG. & SUPPLY CO.
2929 So. Fairfax Ave., Los Angeles 16, California
Telephone TExas 0-3734



MODEL SES

MODEL SEC — Forced air furnace. Stainless steel heat exchanger sections seam and arc welded. One piece cast iron burners with drilled ports. Oversize double inlet blower, glass or washable filters. 6 sizes — 70,000 to 245,000 Btu input. For zero clearance.

REPRESENTATIVES

M. Blazer & Son, Passaic, New Jersey.
Blue Flame Supply Company, Atlanta, Georgia
Eugene Bolstad, Edmonton, Alberta, Canada.
E. B. Bomar, Phoenix, Arizona.
Boyd Engineering Co., Albuqnerque, New Mexico
And El Paso, Texas.
Reube O. Emery, Nashville, Tennessee.
F & D Distributors, Salt Lake City, Utah.
Leudecke Engineering Co., Austin, Texas.
McCombs Supply Co., Denver, Colorado.
O'Connor-Oklahoma Co., Oklahoma City,
Tulsa, Oklahoma & Wichita, Kas.
Smith Steam Specialty Co., Kansas City, Mo.
Toy-Holbrook, Inc., San Francisco, California.
F. R. Young, Houston, Texas.
Dealers Supply Company, Atlanta, Georgia.
Jewell & Company, Hot Springs, Arkansas.
Homer Maxey & Company, Lubbock, Texas.
Noland & Co., Newport News, Va.
Temp-Control Corp., Portland, Oregon

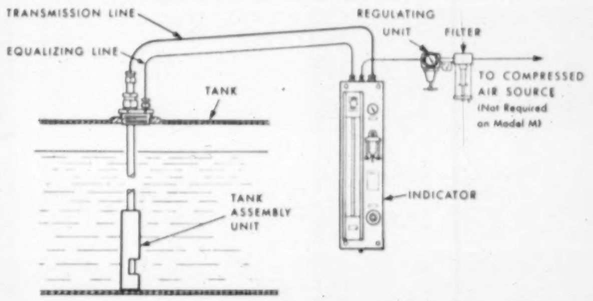
MODEL SES—Forced air, suspended furnace for installation in suspended duct system. Inlet and outlet designed for sheet metal duct connection. Double inlet forward curved blower. Continuous duty variable pitch drives, raised port burners.

Petrometer Remote Reading LIQUID DEPTH GAUGES

SERIES 1400

For Accurate, Reliable Measurement of Depth of Liquid in Storage Tanks and Process Vessels. Operates on the principle of hydrostatic pressure...No moving parts...No electrical connections. Gives true reading of contents of tanks above or below the ground.

The Petrometer Industrial Indicating System consists of 5 basic parts: (1) The Indicator, (2) The Tank Assembly Unit, (3) A copper tube transmission line, (4) A copper equalizing line and (5) A manual or automatic source of compressed air for purging the transmission line.



PETROMETER INDUSTRIAL INDICATING SYSTEM

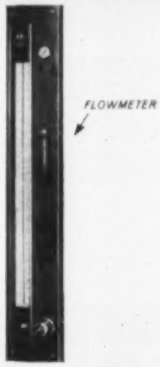
FOUR *NEW* MODELS TO CHOOSE FROM . . .

MODEL 1400 A

Equipped with aerator valve for semi-automatic indication.

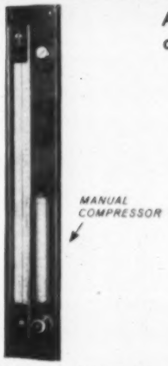
MODEL 1400 B

Equipped with bubbler to give visable evidence of continued aeration. Readings are automatic.



MODEL 1400 F

Equipped with flowmeter in lieu of bubbler.



MODEL 1400 M

Equipped with manual compressor for installations where there is no source of compressed air.

All Petrometer Series 1400 Models, A, B, F and M have these design features:

(1) "Sealed In" Indicating Liquid. Cannot spill during transit.

(2) A one-piece extruded aluminum indicating unit with separate channels for scale and window.

(3) All functional parts are contained on the instrument panel — none on the mounting plate or as separate units.

(4) Easy Installation. Simply mount back cover on wall and plug the instrument panel into the female receptacles for quick-lock fastening.

Send For Bulletin 6004H

Petrometer

All 1400 Models are obtainable in 8 types for different tank depths.

HOW TO SELECT THE *Right* GAUGE . . .

KEY NUMBER	TYPE	INDICATING FLUID
1 to 64	442	RED-X
65 to 96	443	RED-X
97 to 120	444	RED-X
121 to 144	445	RED-X
145 to 164	446	RED-X
165 to 270	552	MERCURY
271 to 410	553	MERCURY
411 to 520	554	MERCURY
521 to 610	555	MERCURY

To determine the right type:

1. Multiply the vertical depth of the tank in inches by the Specific Gravity of the liquid. This result is the key number.
2. Using the key number select the correct type from the table.

To determine the right model:

1. If compressed air is available select one of 3 models, A, B or F, described above.
2. If no compressed air is available use Model M. Tank assemblies available in brass, stainless steel, Monel, nickel, aluminum, lead, black iron, uscolite plastic. Transmission and Equalizer tubing available in multiples of 10 feet.

MULTI-GAUGE PANEL UNITS

Petrometer Series 1400 Indicators can be obtained in multiple units incorporated on a single panel and mounting plate to meet your specifications. Ideal for central control systems.

Petrometer Indicating Units, component parts and all accessories can also be purchased separately.

LIQUIDEPTH INDICATORS, INC.

43-22 TENTH STREET **LONG ISLAND CITY 1, N. Y.**

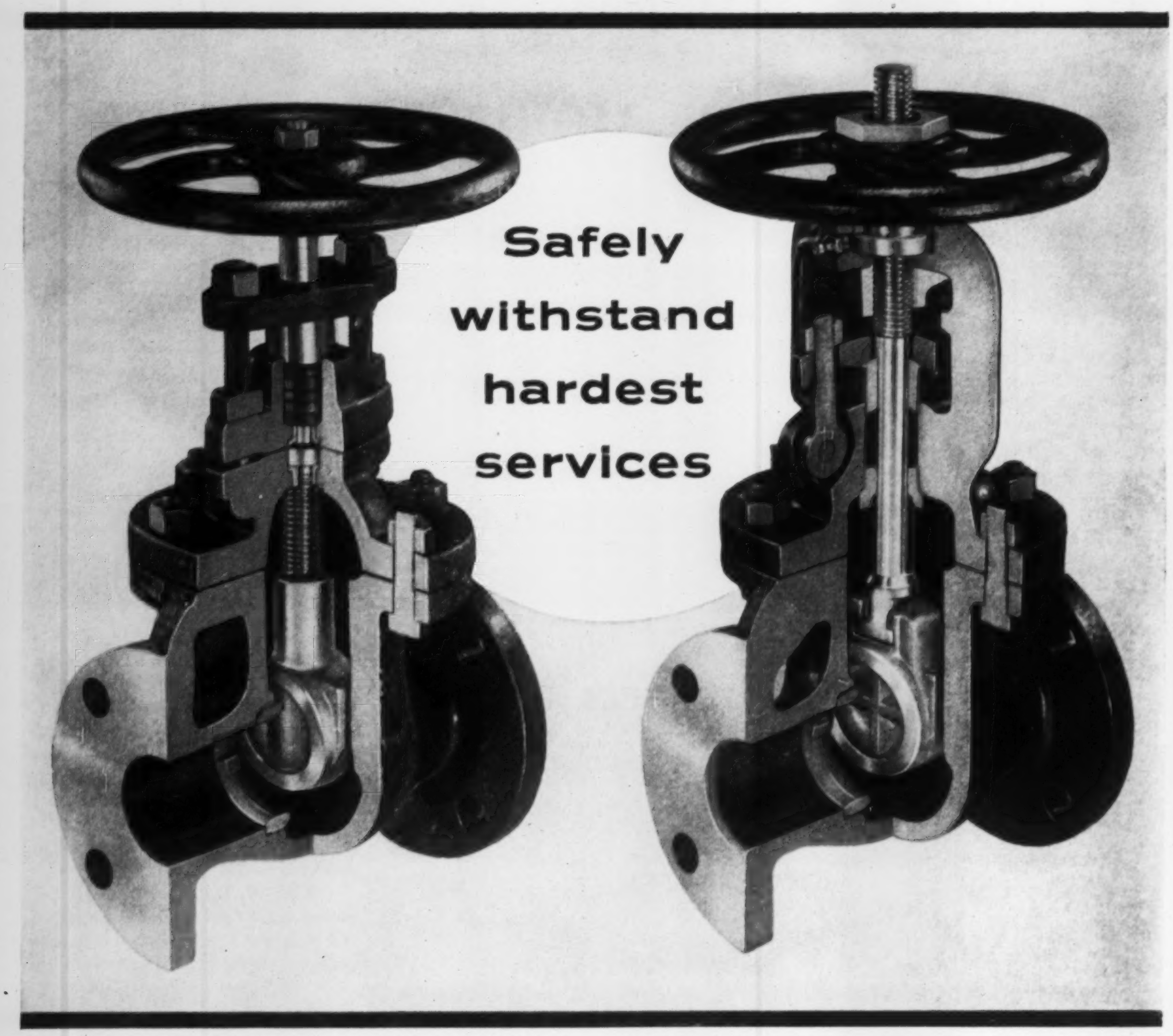


Fig. 1138 (left) non-rising stem, Fig. 1140 (right) OS&Y... two of 29 OIC iron valves with steel valve features. Metals used for trim and pressure parts in this line include: bronze, manganese bronze, nickel-plated steel, higher strength iron, nickel-alloyed iron, Monel, 18-8 stainless, 11-½-13 chrome.

Reduce valve wear. Choose from 29 OIC iron valve numbers with 9 different trim and body metal variations. Depend on them for general use and process industry services handling alkaline liquors, creosote, sour crude, sulphuric acid and caustics.

Working parts design assures positive seating . . . long life

Seat rings are end seated, reducing the probability of loosening in service and affording streamlined flow from port to port. Body wedge guides and a flexible T-head stem-wedge connection combine to assure accurate wedge seating for tight shutoff.

Extra strength adds safety to pressure parts

High-strength iron castings assure pressure parts made to a minimum tensile strength of 31,000 psi. The body and bonnet, elliptical in shape, resist internal pressure with least possible distortion. Body-bonnet bolting provides uniform gasket loading and, consequently, a pressure-tight seal throughout the pressure range of the valves. Tie ribs, cast between the pipeline flange and the body bonnet flange, prevent distortion from excessive pipeline stresses.

This line's many added features, trim variations, dimensions and end openings are completely described in the new OIC specification folder, Form No. 1005. Write for it.

Order valves from your OIC Distributor.

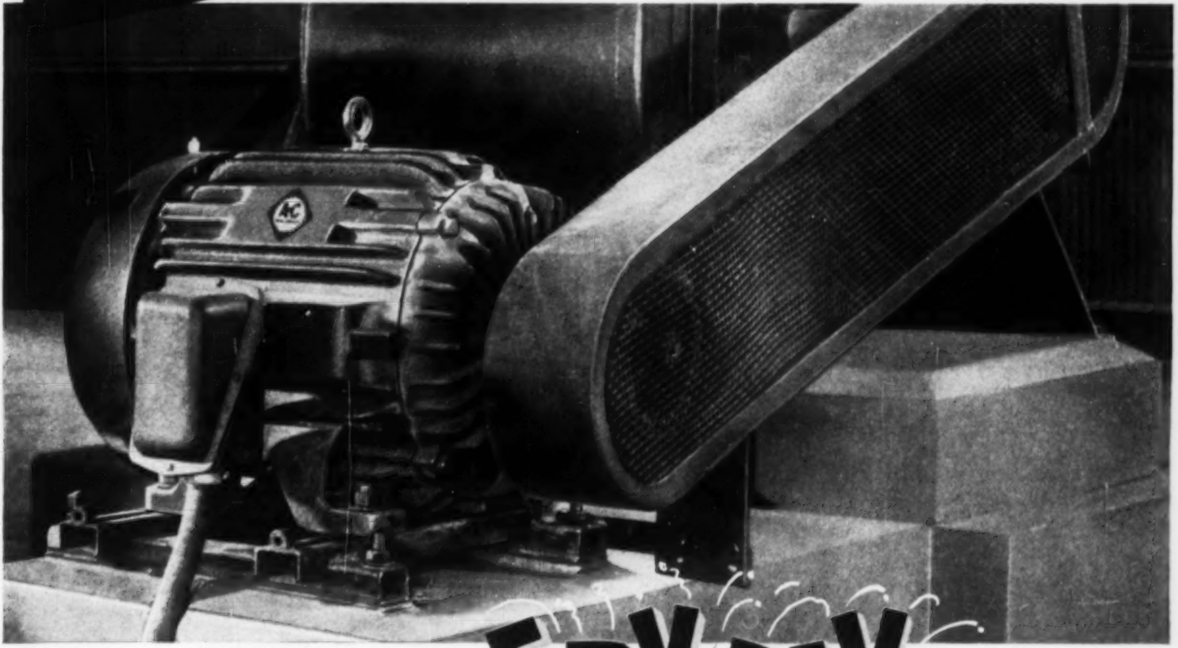
OIC
FOUNDED 1883

VALVES

THE OHIO INJECTOR COMPANY • WADSWORTH, OHIO

**FORGED & CAST STEEL, LUBRICATED PLUG,
BRONZE & IRON VALVES**

There's **MORE** Cooling Surface in these deep-ribbed **MOTORS**



No Day is FRYDAY with these Allis-Chalmers MOTORS

● Frying of insulation is impossible under normal conditions with the extra-large cooling surface of Allis-Chalmers rib-type TEFC motors. The result — you expect and get longer motor life.

The engineered partner of A-C motors is Allis-Chalmers control.

Get Complete Information

As a new machinery component or as replacement, specify Allis-Chalmers. Discuss your particular application with your nearby A-C distributor, A-C district office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

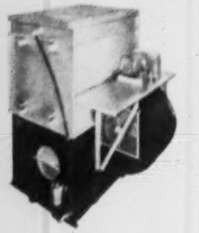
A 4919

B.A.C.

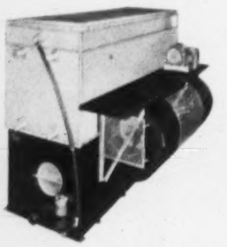
NEW "M" LINE

EVAP. CONDENSERS

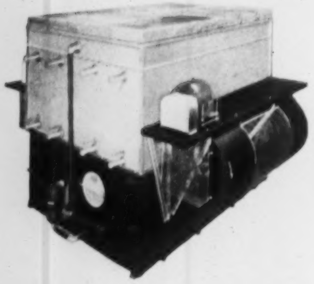
(Pat. Pending)



10 to 80 Series



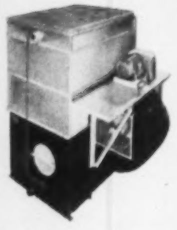
90 to 150 Series



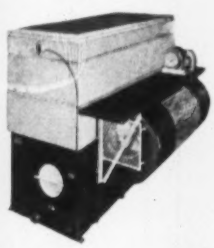
175 to **350** Series

COOLING TOWERS

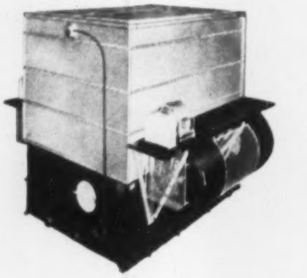
(Pat. Pending)



10 to 80 Series



90 to 150 Series



175 to **400** Series

QUIET—No annoying water-dripping noises from these units! All noises are literally "locked" inside.

SECTIONALIZED—Die-made sections assure absolute matching . . . extremely easy assembly and disassembly.

EXPANDABLE—Units designed to meet any future demands. If future increase in load is anticipated, a unit can be purchased to meet today's requirements and, at any future date, capacity can be increased to meet new demands.

ALL STEEL CONSTRUCTION—Best possible protection against fire, leakage, warping, and change in weight due to water absorption.

RUSTPROOF—Section casings and spray decks are of hot dip galvanized sheets, further protected by B.A.C. Zinc-Chromatized Aluminum Paint. Section panel interiors are coated with B.A.C. Special Mastic which, in addition to protection against corrosion, acts as a sound deadener. Pans are of heavy gauge steel, welded and coated, inside and out, with B.A.C. Special Mastic. Fans handle dry air only.

RUGGED—All units are built of extremely heavy gauge material with double corner construction further reinforcing the structure.

COMPACT—As a result of advance engineering design, these units are unusually compact with minimum floor space and height requirements.

ACCESSIBLE—Units are so designed and constructed that any specific part can be reached without removing any other parts. All moving parts are extremely accessible, greatly simplifying maintenance. A large working platform, easily reached by built-in steps, provides access to fan motor and spray trees.

LOW COST—Standardization and mass production has reduced the manufacturing cost of these units to a minimum, enabling us to offer this quality equipment at a very nominal cost.

B.A.C.

Baltimore Aircoil Company, Inc.
2615 Mathews Street, Baltimore 18, Maryland

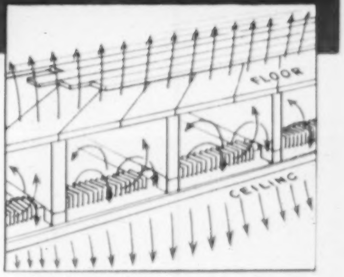
OUT OF SIGHT, SILENT, SAFE and

CLEAN!

KRITZER

Radiant Panel Heating

THIS IS
HOW IT
WORKS



offers *every* advantage to both the Heating Contractor and his customers.

QUICK AND EASY INSTALLATION—One section of KRITZER Radiant Coils equals many lengths of ordinary tubing. The Heating Contractor can install the entire system without requiring special cooperation from other contractors because the coils are not imbedded in any building material.

OUT OF SIGHT—No unsightly registers or radiators. Completely comfortable wall-to-wall living area.

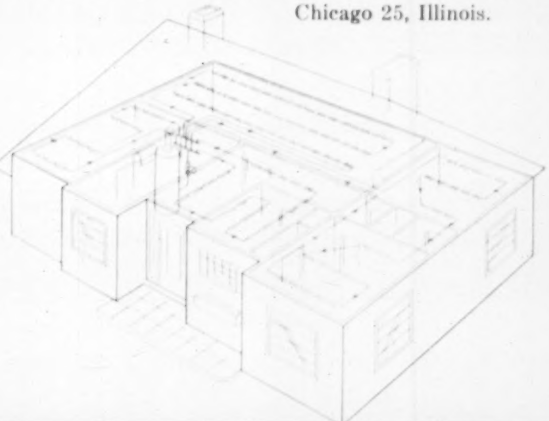
SILENT—No noise of fan blown air through registers. KRITZER suspension of coils assures quiet during expansion and contraction of heating cycles.

SAFE—KRITZER coils touch no part of the building. They heat air only. Aluminum fins on lifetime copper tubing will not rust or discolor.

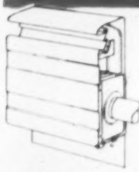
CLEAN—Gentle, dust-free warmth fills each room. There are no "hot spots" to cause dirt streaking of walls and ceilings. No gusty blasts of dusty air.

Runs of coil sections are installed at right angles to the ceiling joists, distributing even heat to the ceiling and/or floor surfaces. These comfortably warmed areas radiate healthful heat energy throughout the room. Shown below is a typical coil layout in the average home.

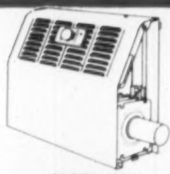
Kritzer Radiant Coils, Inc., 2901 Lawrence Avenue,
Chicago 25, Illinois.



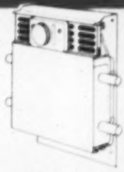
KRITZER QUALITY HEATING PRODUCTS



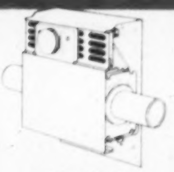
"K" LINE
BASEBOARD



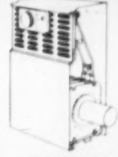
SLOPE TOP
BASEBOARD



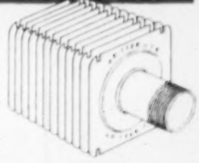
STANDARD
BASEBOARD



UNIVERSAL
BASEBOARD



CONVECTOR,
SLOTTED FRONT



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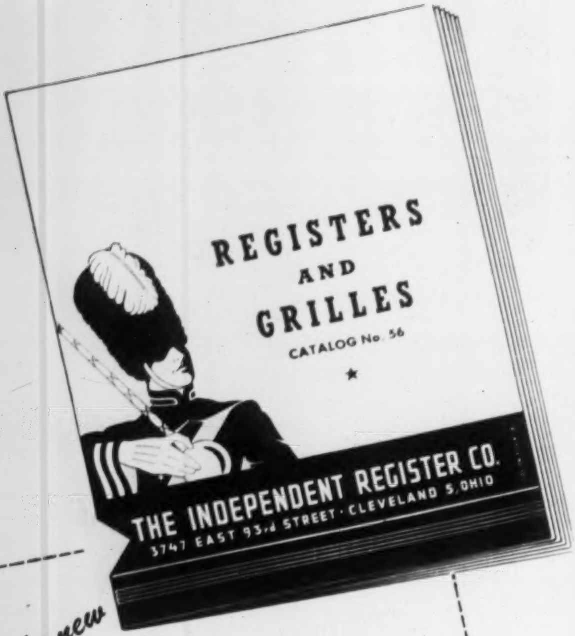
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AND
GRILLES
CATALOG No. 56
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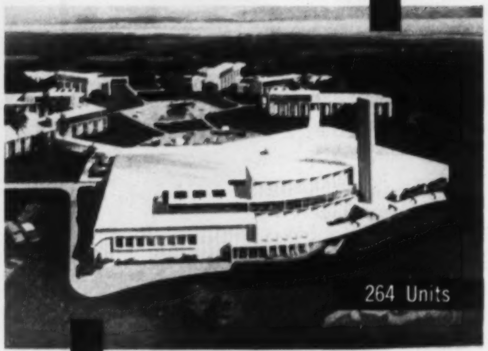
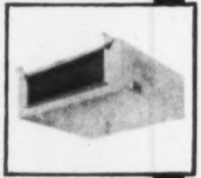


. . . already set for new Lady Luck Hotel, Las Vegas
* rendering courtesy Architect Homer Rissman

LRC Basic Unit



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The new booklet also contains a wealth of helpful information about Ultralite Duct Insulation and Duct Liner. You'll find specifications and instructions for insulating heating ducts . . . cooling or combination ducts . . . forming duct liner with the metal . . . applying surface finishes, both indoors and out. This information makes it easier for you to specify and apply Ultralite than any other duct insulation on the market. Ultralite is the only insulation of long glass fibers . . . the first flexible glass fiber duct insulation on the market . . . the easiest and most economical duct insulation you can use. Get the facts from your nearby distributor, or write today.

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*Equation on pg. 942 of 1955 American Society of Heating, Ventilating & Air Conditioning Engineers Guide or in Gustin-Bacon's new Duct Brochure.

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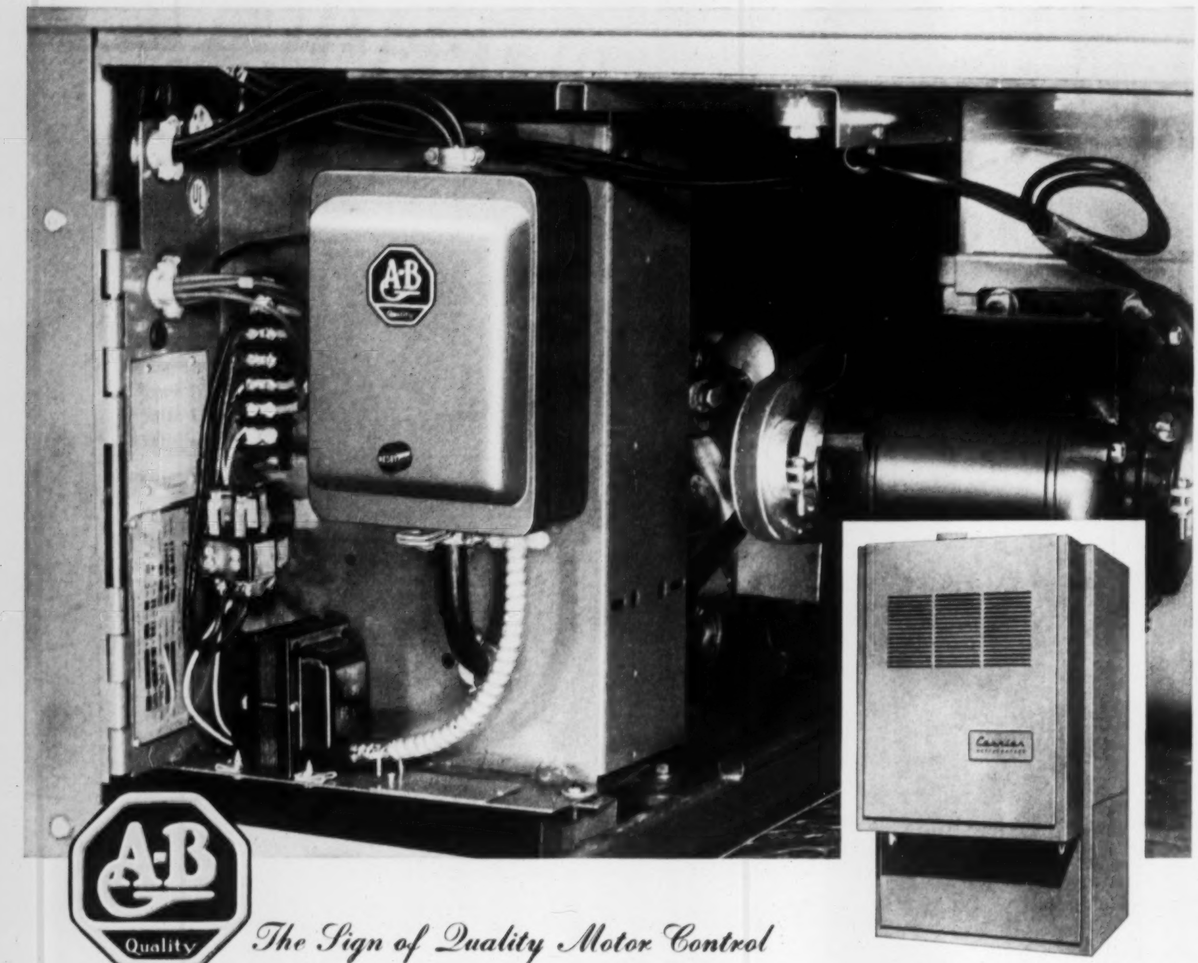
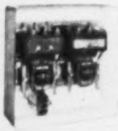


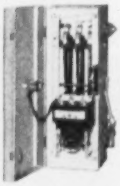
The Sign of Quality Motor Control

Carrier Weathermaker No. 38C
air conditioner for residential use

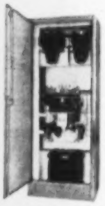
Typical Allen-Bradley Quality Motor Controls



Bulletin 736
Part Winding
Motor Starter



Bulletin 640
Manual Resistance
Type Starter



Bulletin 746
Automatic Auto-
transformer Type
Starter

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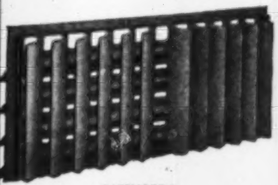
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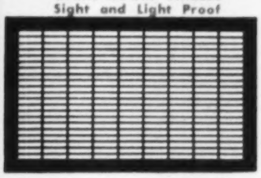
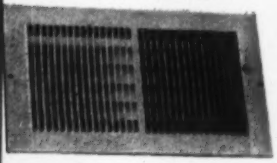
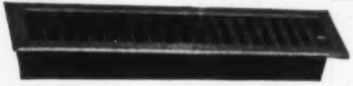

ARCHITECTURAL GRILLES


Multiple Valve Registers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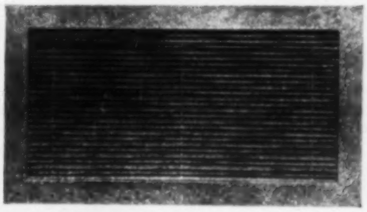
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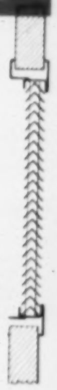

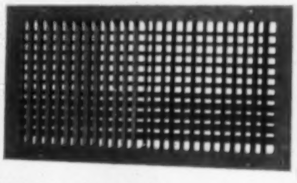

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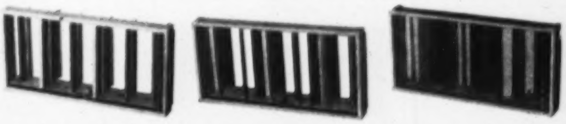

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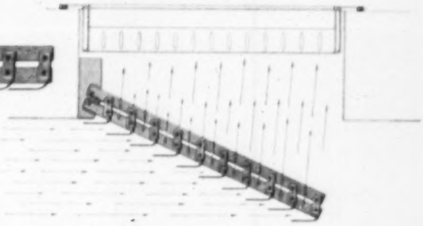

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Eliminates turbulence. Reduces noise level.

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Above, a group of "Buffalo" [illegible] Vent fans are used for exhausting [illegible] Limit-Load® Fans supply [illegible] tempered air to hospital service [illegible]

reason for fans!

Above, one of the super-quiet "Buffalo" Limit-Load® Fans keeping operating rooms of the hospital dependably ventilated. Write for Bulletin F-101 for details on this proved line of fans.

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***The "Q" Factor** — *the built-in Quality which provides trouble-free satisfaction and long life.*

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TA-5062(P)

1956 Forecast: Best Year Yet

- **business to increase 5 percent**
- **capital investment to rise 13 percent, to $33.4 billion**
- **new construction to reach $44 billion**
- **new stores will be bigger and air conditioned**
- **big year ahead for heating, piping, and air conditioning**

THIS YEAR will be the best yet for total economic activity. Most forecasters agree that business will increase 5 percent over last year, mainly in the first six months. The second half will be very good also, but without further rise.

The 1956 boom will be at a slower rate than 1955's, mainly because the economy is now operating at near capacity, whereas last year it was recovering from a minor recession.

While expansion in 1956 is therefore limited, the country's long term economic growth is definitely up. Gross national product, about $390 billion in 1955, is expected to hit $500 billion in 10 years.

Plant and equipment spending — planned by most industry groups — will increase in 1956 13 percent, up to $33.4 billion, according to a survey by McGraw-Hill's department of economics. Capital spending in manufacturing facilities will rise more than 30 percent.

Building Booms 11th Year

Total construction outlay, up for the 11th consecutive year, will account for 16 percent of the expected gross national product of $400 billion in 1956. $44 billion will go for new construction and over $21 billion for modernization, repair, and maintenance.

New plant construction will be up 17 percent, commercial construction 14 percent, religious and educational building 10 percent, and military construction 14 percent, economists predict. Nonresidential construction volume is expected to increase sufficiently to offset an anticipated moderate decline in housing activity, according to the F. W. Dodge Corp.

Probable 1956 expenditures of $2¼ billion for stores and other service establishments are 17 percent above the 1955 total and 80 percent above that for 1954, according to the U. S. Depts. of Commerce and Labor. A record $850 million is in prospect for religious buildings this year, they estimate. Private and public educational building will total $3¼ billion. Hospital and institutional construction will be $625 million, lower than last year. Social and recreational building will be $275 million, up 12 percent.

Stores Expand, Modernize

Many new branch department and specialty stores and a number of new regional shopping centers will be erected in 1956, according to J. Gordon Dakins, executive vice-president of the National Retail Dry Goods Association. Along with this, development of downtown areas will be stepped up this year.

At least 10,000 new grocery stores will be built by members of the National Association of Retail Grocers of the U.S., says Marie Kiefer, secretary-manager. This will be about 2700 more than they constructed and opened in 1955. The new stores will be bigger, "frillier," and more expensive, she said. The trend is toward more lavish stores of unusual design, with more conveniences for the customer, from air conditioning to automatic doors.

In 1956, 19 percent of NARGUS member stores will remodel, compared with 24 percent last year, reflecting several years of intense modernization.

Chain food stores are also expanding. Without exception, member companies of the National Association of Food Chains plan to open new markets in 1956, according to John A. Logan, president. A sample group representing about one-fourth of total chain food industry sales indicated that new stores to be opened would total about 8 percent of existing stores.

Almost every company has extensive plans for remodeling and renovation of existing stores. A survey shows that in the 15 year period from 1940 to 1955, 26 percent of the stores built in 1940 had been abandoned, 51 percent are still in business but have undergone major remodeling, such as installation of air conditioning and other improvements. Only 23 percent of the sample of 100 stores built in 1940 continue to operate in the same spot without major remodeling.

Another industry that is greatly expanding its capital investment, and hence its construction, is the meat industry. Says Wesley Hardenbergh, president of the American Meat Institute, he counted 130 new plants being opened or built and about 40 plants being remodeled, in a review of trade publication reports for a recent 12 months' period.

Out of line with the general

increase in capital expenditures for 1956 are farm equipment dealers. Because of lower farm product prices and higher prices for other things, Paul M. Mulliken, executive director of the National Retail Farm Equipment Association, says that even the dealer who has the ability to increase his capital investment by expanding or putting up a new building, will hesitate to do so for fear of creating the wrong impression among his customers. Sales of new equipment are expected to be down 40 percent this year.

Big Year for the Industry

With expenditures for nonresidential construction in 1956 expected to rise 12 to 15 percent, "this year and the big construction years ahead present the heating and air conditioning industry with a grand opportunity," declares Lawrence S. Redford, executive vice-president of Jackson & Church Co.

The air conditioning industry in 1956 will break all previous records for the seventh consecutive year, with total sales at retail of about $3.2 billion, predicts Cloud Wampler, chairman and president of Carrier Corp. The biggest percentage growth will again come in the residential field.

The 1956 retail estimate for the industry was broken down by Mr. Wampler as follows: room air conditioners, $435 million; complete home air conditioning, $312 million; commercial packaged air conditioning, $189 million; built-up air conditioning and refrigeration systems of all sizes, $1 billion; all other, $565 million.

Noting the trend toward year 'round comfort, L. B. Gruman, Jr., secretary of The Mechanical (Heating, Piping & Air Conditioning) Contractors Association of America, sees the industry continuing at a high level during the first quarter.

The recent merger of the AFL-CIO, he says, will bring new responsibilities as well as problems to the collective bargaining table.

Business prospects in the warm air heating and air conditioning industry for 1956 will exceed 1955, the greatest year on record, writes George Boeddener, managing director and secretary-treasurer of the National Warm Air Heating and Air Conditioning Association.

"It is difficult, however, to predict what the percentage of increase will be, because of several factors," says Mr. Boeddener. Shortages of both labor and materials, indicated in 1955, appear likely to limit business expansion in the field.

Space heating for an entire community or vast segments of large cities by atomic energy sometime in the future is seen one of atomic energy's first footholds by Sen. Clinton P. Anderson (D., N. M.), chairman of the joint congressional committee on atomic energy.

Gas Gains 8.2 Percent

Gas utility and pipe line companies predict another record year for the industry in 1956, based on new highs reached last year in the number of customers served.

In 1955, according to Dean H. Mitchell, president of the American Gas Association and president of the Northern Indiana Public Service Co., the industry sold approximately 66.5 billion therms of gas, a gain of 8.2 percent over 1954. Natural gas sales soared to a new high of 62.9 billion therms, a boost of 6.4 percent. Manufactured and mixed gas sales totaled 3.5 billion therms, an increase of 3.9 percent.

For new construction and expansion of facilities, the gas utility and pipe line companies spent $1.3 billion in 1955 and expect to spend about the same in 1956.

The gas industry "will come of age" in 1956, according to Willard F. Rockwell, Jr., president of the Gas Appliance Manufacturers' Association and president of Rockwell Manufacturing Co.

"With the extension of natural gas to the Pacific Northwest," says Mr. Rockwell, "47 of the 48 states will be receiving natural gas. Only Vermont remains without service."

The industry now operates a 469,000 mile network of transmission, distribution and gas gathering pipe lines, all but 50,000 miles of which carry natural gas alone.

The rate of discovery of proved and recoverable supplies of natural gas still continues to exceed the production rate, he said.

Oil Expects Top Year

The automatic oil heating industry expects another top year in 1956. R.H.L. Becker, managing director of the Oil-Heat Institute of America, Inc., says shipments of oil fired burners, boilers, and furnaces, up 12 percent in 1955, are not expected to fall off in 1956. In the commercial-industrial field, there was a drop in shipments of conversion burners and a trend up in shipments of integral units. Sales of these types of oil fired equipment can be increased heavily in 1956, Mr. Becker says, "if the manpower is available."

Coal and Stokers Surge

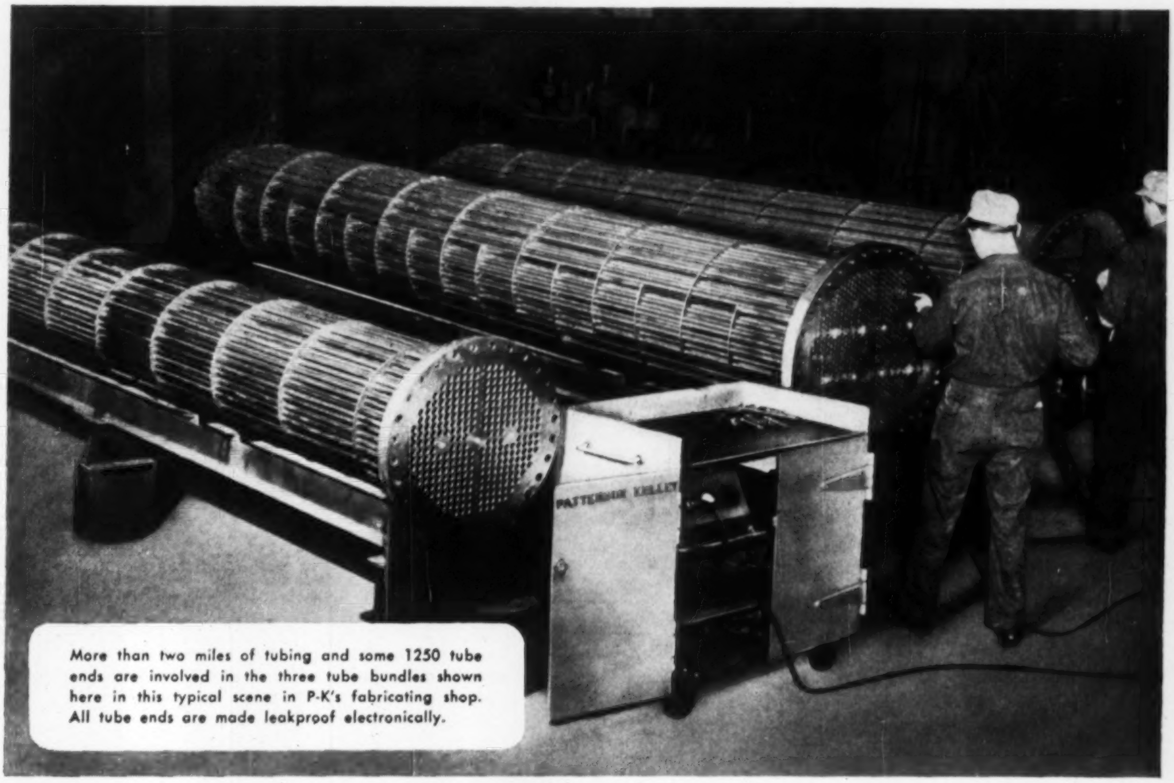
The stoker industry assumes that the upsurge in coal production in 1955 will continue into 1956 and beyond. Stoker sales, up in 1955, therefore should continue to increase, says L. C. Dubs, president of the Canton Stoker Corp.

Mr. Dubs attributes to the increasing mechanization of coal handling and coal burning equipment "a more favorable reception for coal in many commercial and industrial plants."

Steam To Meet Politics?

The National District Heating Association expects continued progress in 1956, as it has each year since the war, says John F. Collins, Jr., secretary-treasurer. The Association sees the coming presidential election as a possible hamper on service expansion and sales progress, "since some building projects may be delayed until the people who hold the purse strings see which way the wind is going to blow."

(*Continued on page* 166)



More than two miles of tubing and some 1250 tube ends are involved in the three tube bundles shown here in this typical scene in P-K's fabricating shop. All tube ends are made leakproof electronically.

HOW ELECTRONICS MAKES P-K EXCHANGERS BETTER THAN EVER

These men are expanding tube ends into the tube sheet—the "inner face" of a shell and tube heat exchanger that holds each tube in place. It's a time-consuming, precision-demanding job. Yet by doing it *electronically* with the equipment you see here, the circumference of *each* tube is joined to the face of the exchanger with exactly the same pressure. The fit is as nearly perfect as modern science can achieve. No leaks can develop in service because of the precise and uniform expansion of the tubes.

Electronic expansion of tubes is an example of how the fabrication of heat exchangers has changed since **p-k** built its first unit in 1880. But the fundamental method of building a good heat exchanger, like the shape and form of a shell and tube unit itself, has changed very little. The thermal design must be *right* . . . the craftsmanship *exact* . . . the testing *scrupulous.*

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• Paper stock • Waste sulphite liquor • Alkylaryl sulfonate • Sugar liquor • Vinyl pyridine

• Saturated brine • Grape juice • Tomato juice • Press liquor • Calcium bisulphite • Melt

Phenolized ammonia • Ammonia liquor • Sulphuric acid • Paraffine oil and water • Sludge

• Milk waste • Gritty water • Cane syrup • Lime & soda solution • Cachaza • Clear juice

White water • Mineral oil • Chromic acid Cement • Gasoline • Depanol

Brine • Vegetable oil • Licorice liquor • Flume water •

• River water • Benzine thinner • Mash

Methylene chloride • Sodium hydroxide

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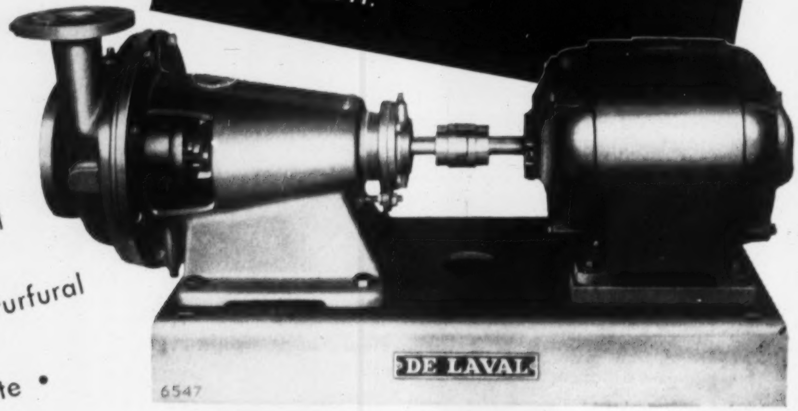
HEADS TO 200 FT.



WRITE FOR BULLETIN 1125-B

DE LAVAL *Centrifugal Pumps*

DE LAVAL STEAM TURBINE COMPANY

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"Open for Discussion"

• WE FOLLOW HERE each month the practice at engineering society meetings of providing an "open for discussion" period. You are urged to take part. Just address your comments to the Editors, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2.

Article on Boiler Room Arithmetic Simplifies Measuring Heat Input

The article, *Eliminate Boiler Room Arithmetic*, by George H. Amber in the December 1955 HPAC is of interest, and I would like to comment upon it.

The author is to be commended for providing a very useful and time saving method for engineers and servicemen when measuring the heat input to a gas burner. It might be pointed out that if greater accuracy is desired, the time interval could be increased 10 times and then multiply the difference in the gas meter readings by 10,000 to get the input in Btu per hr.

C. W. Signor
The Detroit Edison Co.

Avoid Cold Blast Effect In Evaporative Coolers by Mixing Hot Air, Outside Air

I have read the article, *Cool Industry Hot Spots With Evaporative Coolers*, by Robert S. Ash in the December 1955 HPAC. Mr. Ash successfully calls attention to an often overlooked possibility for providing relief cooling around hot industrial equipment. A point that could be emphasized, however, is the source of the air into the cooler.

In the crane cab example, cited in the article, the source is obviously the heated air in the building. In other cited examples, the user could have the choice of using inside or outside air.

Since evaporative coolers achieve only 50 to 80 percent humidifying efficiency, the advantages of using the cooler outside air as a source for the cooler are apparent. Since too great local temperature changes are physiologically dangerous, it will frequently work out that using outside, lower temperature air as a source and allowing some mixing between the hot air and the cooled blast results in good results with smaller cooling equipment. Applications should be analyzed considering each of the possible air sources.

S. F. Duncan
Director of Research
Farr Co.

The Author's Reply — Mr. S. F. Duncan's comments have some good points. Each cooler application should be analyzed with consideration given to the source of air supply. In some cases, such as the crane cab illustration, inside air would be used. Others might dictate the use of outside air or, as Mr. Duncan pointed out, a mixed supply. This aspect was not covered in my article, since it properly falls in the category of system design. No attempt was made to give information on design, as the purpose of the article was to discuss the often overlooked advantages of evaporative cooling for relief and spot cooling in industry.

Robert S. Ash
Assistant to the President
International Metal Products Co.

School's Modified Warm Air System Found Interesting, But Questioned

I noted the article, *Slab-on-Grade Schools Heated by Warm Air Panels and Convection*, by Fred S. Dubin, in the May 1955 HPAC on which I should like to comment.

The modified warm air system described is surely interesting and should — in certain types of buildings — result in fine heating. A few questions came to mind while reading about the system which I would like to discuss.

The outdoor air quantities seem to be controlled by outdoor temperatures. Fuel economy would dictate differently, in my opinion. On the average heating day, but particularly in fall and spring, cooling is required in fully occupied rooms and sunny exposures, while heating is called for in the partly occupied and shady ones. Wouldn't the outdoor air quantity be best controlled by room or zone thermostats?

In mixing recirculating air from various classrooms in a central plenum and then delivering this air to the classrooms — even through filters — would there not be a tendency of transmission of carriers of communicable diseases from one classroom to another? I assume that germicidal treatment would take care of this point in schools, but is this treatment accepted by a medical majority? I have heard arguments pro and con on this.

The statement that floor slabs are kept at temperatures of from 70 F to 74 F with the system shown in Fig. 3 is questioned. As I, and others, have pointed out previously in publications, reasonably even floor surface temperatures cannot be maintained where pipe spacing exceeds 18 in. Although ducts can be spaced at slightly greater distances where even floor surface temperatures are desired, a proper test would indicate considerable variations of floor surface temperatures between floor surface directly above the tube and that between, providing the air duct is in contact with the concrete slab. If the duct is below the slab or is insulated, the title of the article which indicates "heating by warm air panel," seems to be misleading to me.

There is a valid reason why this system should not be grouped with true panel heating. True systems concentrate heat output near large glass areas, and lower floor surface temperatures are experienced near inside walls. I do not believe that this can be achieved by means of the warm air panel-convection system described in Mr. Dubin's article.

The reference to round fiber tube ducts was noted with interest, as I have in my files a recent letter from a general contractor who experienced difficulties with such ducts. Some long runs became obstructed after concrete was poured. I would like to know if special precautions are provided in this installation to avoid or remedy such occurrences.

In connection with the controls of the system, I would like to point out that from experience with a somewhat similar system that I designed in 1948, it appears that the heat absorption and release of the concrete envelope around the conduit has some bearing upon the speed of response of controls. More distant classrooms will be slower in completing the control and heat-up cycle. Thus, on larger school buildings, response of the controls may become a serious problem.

The section of the article about the economy of the system caused me concern. A saving of $18,200 was reported in heating the campus type school by four separate furnaces, and a simultaneous fuel saving of from 15 to 35 percent was reported. I am wondering if the $18,000 saved is based upon a total heating cost of $180,000, or of $36,000. I would also like to know if this saving on construction cost is due to the fact that the four sections of the school are separated by long corridors. Also, if long corridors are used and the four sections of the school are of sizable proportion, or even include an auditorium—wouldn't a central steam or hot water system be equally economical? Further, was additional cost—if any—for structural provisions considered? No doubt certain structures would lend themselves favorably to this system and others not. Mainly, however, how could fuel economy of an even moderately well-designed plant be improved 15 to 35 percent? The magnitude of this saving would indicate one of two things—either that the heating plant causing additional fuel consumption was poorly designed, or that insufficient measurements were taken, or the computations and research performed to compare the two systems were not complete. In research activities that I have conducted I have found that statements of this kind made by owners or operators of heating plants would not hold when actual test measurements were made.

It was also noted that a heat exchanger is used in warming up outdoor air. At an average winter temperature of 35 F and an exhaust air temperature of 70 F, would not an air to air exchanger designed for such small differences of temperature prove rather prohibitive in size and price if designed to recuperate considerable quantities? The actual percentage of recuperation must be small.

Mr. Dubin should be rightfully enthusiastic in having worked out an interesting solution to the school heating problem. However, such enthusiasm should be backed up with facts so as not to influence engineering reporting. Such reporting should quote advantages together with disadvantages and should be based on complete information.

No doubt the system shown may prove significant in regard to heating smaller school buildings, but there is equally no doubt that steam or hot water heating will prove at least of equal economy, quality, and controllability in larger buildings, and that fuel economy of properly designed systems should be identical for air, steam, or hot water.

R. G. VANDERWEIL
Consulting Engineer

If Boiler Will Carry More Than SBI Load, Why Not Rate It Accordingly?

I AGREE with Mr. Hunter's comments, *Clarifying SBI Boiler Load Ratings Shows Difference Not Too Great*, in the October 1955 HPAC, that the 20 percent increase in rating for Steel Boiler Institute Table No. 1 boilers as compared to Table No. 2 is not an alarming increase in rating.

As city officials, we feel that it is not our duty, in issuing permits for heating boilers installations, to judge as to how much more load than the SBI rating can be connected to a boiler. I see no reason why Table No. 1 boilers should be rated at less Btu per sq ft of heating surface than Table No. 2 boilers. If a boiler will carry more than the SBI load comfortably, it would seem logical to rate it accordingly.

If all types of boilers were rated on the same basis, rather than by three or four methods, consulting engineers and architects could compare all boilers on the same basis. Undoubtedly, the most logical basis would be a nozzle rating in Btu per hour. Unfortunately, the maximum rating which boilers can develop under test would result in an excessive fuel input for actual service, particularly with on-off type burners. Large boilers are usually rated on a continuous output basis, plus a 1 to 2 hr overload rating. This type of equipment receives the best of maintenance, and feedwater conditions are maintained nearly perfect. Since heating boilers seldom receive equivalent service, a reduced rating will help prolong the life of the boiler.

From Mr. Hunter's figures it is evident that Table No. 1 SBI boiler ratings will carry nearly 200 percent of the SBI ratings. Since everyone will undoubtedly agree that this would be excessive, it would seem logical that a reasonable rating could be determined between the present ratings and 200 percent of present ratings.

The life expectancy of all boilers fired at the more conservative ratings is greater than boilers which are pushed to the limit. Until more information is made available on the subject of boiler life, the purchasers of boilers will continue to have difficulty in selecting the proper size boilers.

I also noted one typographical error in Mr. Hunter's comments. I believe line 3, last paragraph should read "higher." Should his statement have read, "It should be noted that at least one boiler manufacturer catalogs large steel boilers with bases much *higher* than 15 in." rather than "much *lower* than 15 in."?

Herbert C. Johnson
Chief Smoke Regulation Engineer
City of Columbus, Ohio

Do Some Plants Actually Use Overhead Pipe Heating System?

I was interested in C. N. Mattioli's comments, titled *Heating by Overhead Pipes Common Practice Abroad*, in the December 1955 HPAC in answer to the question, *How Can Overhead Pipes Be Used To Heat Plant?* This is very interesting.

I was surprised to see that systems of this type are actually in operation. From a theoretical standpoint it would not seem like a very economical way of heating unless it utilized heat that would otherwise be wasted.

It would seem to me that if the overhead pipes were 20 ft or more above the heads of the personnel, some means of forced circulation would be required to be very effective as a heating system.

I would like to see some data on how Mr Mattioli derives his emissivity factor for use in his heating calculations. I would also like to know what kind of material he uses for the reflectors and if they are galvanized sheet metal, aluminum, stainless steel, or some other material.

Sheldon R. Higgins
Mechanical Engineer

Advise Beginning Piping Engineers Of ASTM Carbon Steel Grades

Sabin Crocker and HPAC have performed a great service in presenting *Latest Steel Pipe Specifications, S-Values, and Welding Procedures Summarized For Power Piping* in the November HPAC. This is an excellent summary from many sources and it will be useful both to experienced piping engineers and to beginners.

The beginners, however, should be advised that the terms Grade A and Grade B do not have the same meaning when applied to pipe as when applied to milk. For quality carbon steel piping, ASTM Specifications A 53 and A 106, Grade B is generally a better product than Grade A, except as Mr. Crocker indicates, for applications requiring considerable deformation during fabrication, and, in the opinion of some users, for low temperature applications.

John E. Brock
Professor of Mechanical Engineering
U. S. Naval Postgraduate School

Solve Window Downdraft with Continuous Slot for Air Return

I would like to comment on the article *Continuous Slot Air Delivery Under Large Windows Prevents Drafts in New School Under Construction*, by K. L. Beseke and L. J. Schutte in the November 1955 HPAC. This is an interesting approach to the downdraft problem encountered in modern classrooms, even if not an entirely new approach. While it is agreed that the introduction of air at a high velocity effects good distribution of air throughout the room—unit ventilator manufacturers have recognized this for years—it is not agreed that the most logical approach to the window downdraft problem is that based upon directing air against the window surface.

The article states that cold convection currents are experienced near windows when the outside temperature is near zero F. This of course is true, but our experience indicates that window downdraft conditions may also exist with outdoor temperatures as high as 35 and 40 F. Our experience has also demonstrated that often when a classroom is oriented to receive high solar gain, cooling air must be introduced into the room part of the time when the outdoor temperature is as low as 15 F.

Thus, there may be many periods when not only does the window downdraft condition exist, but at the same time air which is from 10 to 15 F cooler than room air is being admitted into the room for cooling. It is during these times that if the discharge velocity is not maintained at a sufficiently high level the addition of cooling air along the windows may actually aggravate the downdraft.

There are several reasons for believing that with the system discussed in this article difficulty may be experienced in maintaining a sufficiently high velocity to cope with the downdraft. One reason is that the relatively elaborate and complicated air distribution system may be difficult to balance. Another is that as the filter loads up, the air volume and consequently the velocity will decrease. This latter objection is one which is believed to be inherent in any system which attempts to "blow" the downdraft away.

I believe that a better solution to this problem of how to assure elimination of window downdraft during cooling periods would be to utilize the continuous slot as the *return* air inlet. Supply air may be delivered to the center of the exterior wall and discharged from one or more supply outlets. One important advantage with this arrangement would be that the complicated and quite critical baffle and perforated plate arrangement in the plenum chamber could be substantially eliminated. I say this because the window downdraft will tend to drop into the slot because of its own inertia, and variations in exhaust velocities along the slot are of little consequence. A number of central fan systems as well as a multitude of unit ventilator installations utilizing this principle of draft interception demonstrate satisfactory results with respect to both downdraft elimination and good air distribution.

E. Arenz
Herman Nelson Unit Ventilator Div.
American Air Filter Co., Inc.

Suggest Use of Bellows Type Expansion Joint for Tunnel Steam Line

Regarding the article, *Expansion Produces Water Hammer*, by Bill Dopp, in the November 1954 HPAC, here are a few comments that may be helpful.

The thermal expansion in the 12 in. steam line was improperly handled by an inadequate slip joint installation, which "froze" shut because of poor guiding and improper anchoring. Pipe line expansion forced the pipe to buckle when the expansion joint failed to function. Pockets of condensate formed in the low spots and caused water hammer.

I believe that the selection of a bellows type expansion joint and its proper installation would have assured a better job. Bellows type expansion joints cannot "freeze" shut. Unlike slip-joints, motions other than axial can be handled by the bellows type. Consequently, they are able to handle misalignment in the two piping elements. Also, no maintenance is required on the bellows type of expansion joint.

The engineers in this article selected the improper expansion joint for these operating conditions, in my opinion. Building codes and modern design considerations frequently specify tunnel steam lines. Limited space in tunnels pose special design, installation, and maintenance factors so that special care must be given to expansion joint selection, anchoring, guiding, and welding.

The 200 ft, 115 psi saturated steam line of carbon-moly steel pipe, discussed in the article had a total expansion-contraction cycle of over 6 in. Since the line temperature may be as low as − 20 F in a winter shutdown, and with an operating temperature of 360 F at the 115 psi gage at the header, 6 in. of thermal expansion and contraction had to be handled. This is the usual type of pipe line movement, where all the motion is in a straight line along the longitudinal axis. It is called axial motion, axial traverse, or lineal motion. Slip type expansion joints, when properly anchored and guided, are able to handle these motions.

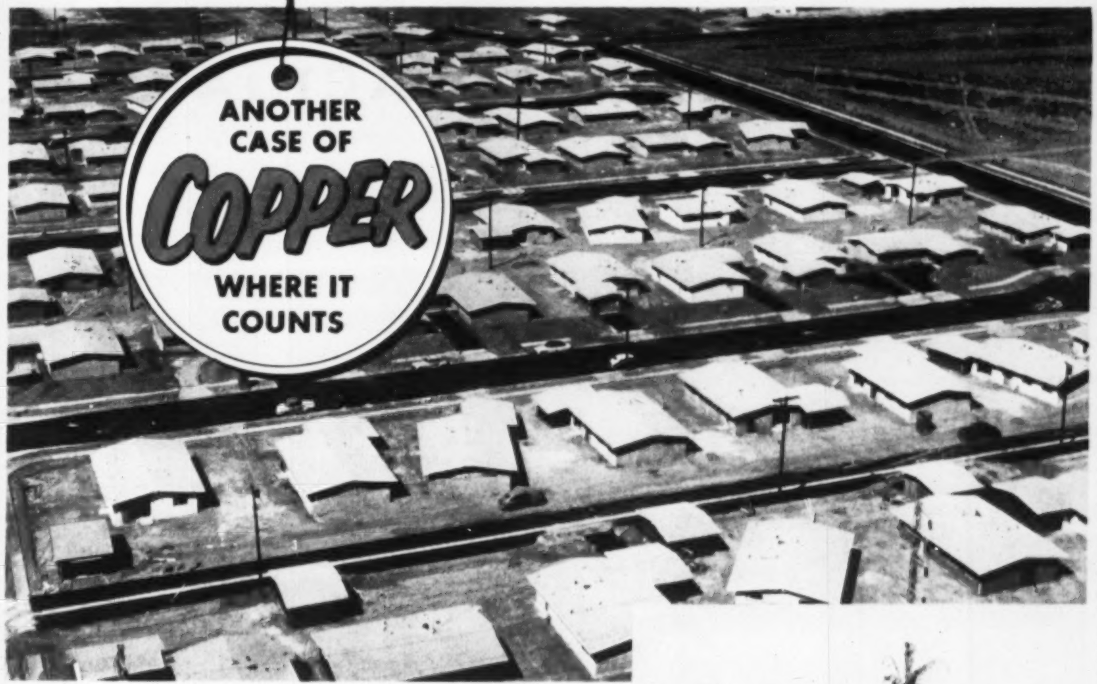
However, this line had motions other than axial. A tunnel installation is not the best place to weld 200 ft of pipe in a straight line. Consequently, there will be lateral and angular motions encountered. Lateral motion is measured in inches of displacement of the two center lines. Angular motion is measured in degrees of tilt between the flange faces or weld ends. Because the slip must enter the housing straight to prevent binding and reduce friction, slip type expansion joint installations require absolutely accurate guiding. And a tunnel is not the easiest place to install the proper pipe guides.

Bellows type expansion joints will handle this 6 in. of axial traverse for thermal expansion, while taking up to 1 in. of lateral motion and combinations of axial, lateral, and angular motions found in snaky pipe lines due to poor welding techniques. A bellows type of joint will take enough misalignment to allow for a slight misguiding of the two pipe elements. The 115 psi of saturated steam is safely handled by the stainless steel bellows pressure carrier and its reinforcing rings. The eight corrugation bellows type expansion joint that the engineers should have specified is rated for about 300 psi and 800 F service.

Slip joints require periodic inspection and packing in order to maintain a seal. When improperly aligned pipe jams the sleeves and foreign material on the lubricant begins to score the wall, the need for repacking becomes more frequent. A bellows type expansion joint requires no packing, as the pressure carrier is of one piece construction.

The 6 in. of axial motion plus the lateral-angular motions encountered in this tunnel line are easily handled by an eight corrugation bellows type unit. A main anchor installed at an elbow or other change in pipe line direction is necessary. The expansion joint should be installed adjacent to the anchor. Where two or more joints are required in a straight run of pipe, the use of intermediate anchors to divide the line into individual expanding segments is recommended. Again, the expansion joint must be installed close to the intermediate anchor. In this installation, pipe guides must be installed within 2 to 4 ft of the expansion joint and at intervals of from 8 to 12 ft thereafter until the intermediate anchors are reached.

A. C. Stimes
Project Engineer
Flexonics Corp.



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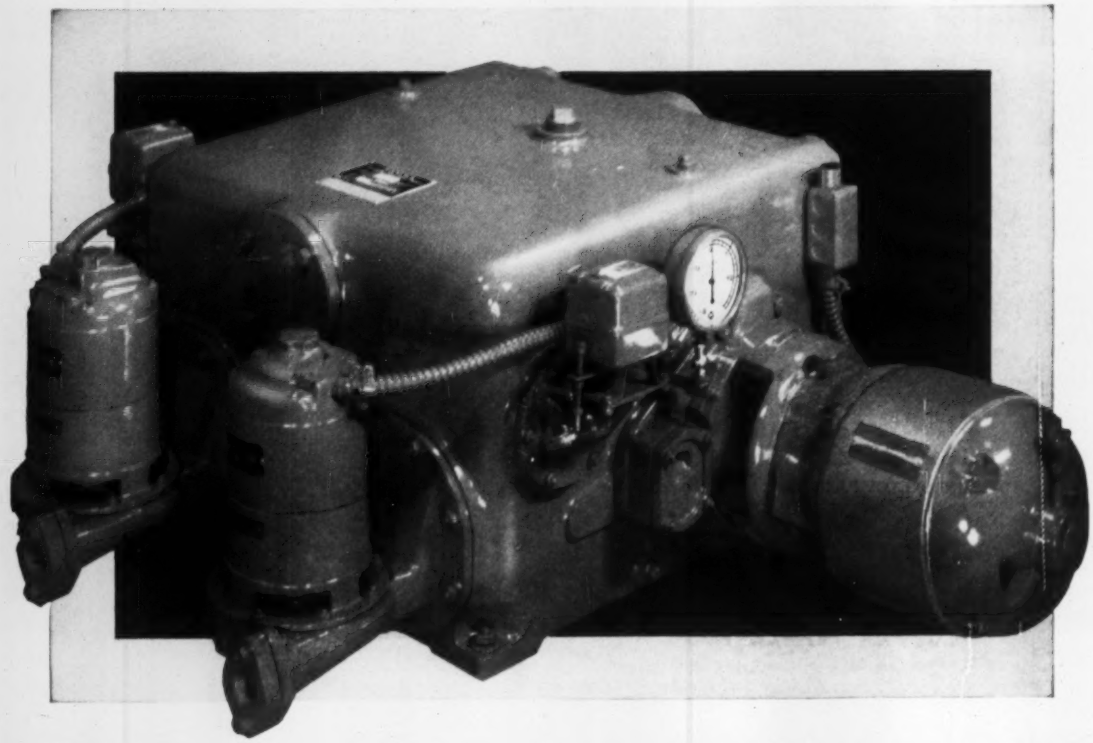

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- ✓ Low, low, return line connection.

NASH ENGINEERING COMPANY
438 WILSON, SO. NORWALK, CONN.

More Economical Steel Pipe Flanges and Fittings Can Be Used

. . . for certain working pressures and temperatures, under new Standard Practice 47 of the Manufacturers' Standardization Society of the Valve and Fittings Industry

By E. C. Rodabaugh
Senior Research Engineer,
Product Engineering and Research Dept.,
Tube Turns

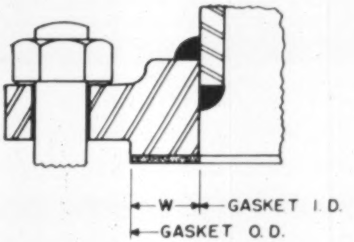

Fig. 1

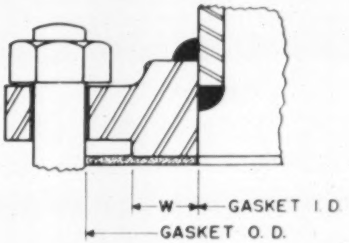

Fig. 2

Table 1 **Group I Gaskets**

Nominal Size, in.	W Gasket Contact Width in.†	Fig. 1		Fig. 2							
		Inside Diameter, in.	Outside Diameter, in.	Inside Diameter, in.	Outside Diameter, in.*						
					150 lb	300 lb	400 lb	600 lb	900 lb	1500 lb	2500 lb
1/2	17/64	27/32	1 3/8	27/32	1 7/8	2 1/8	2 1/8	2 1/8	2 1/2	2 1/2	2 3/4
3/4	5/16	1 1/16	1 11/16	1 1/16	2 1/4	2 5/8	2 5/8	2 5/8	2 3/4	2 3/4	3
1	11/32	1 5/16	2	1 5/16	2 5/8	2 7/8	2 7/8	2 7/8	3 1/8	3 1/8	3 3/8
1 1/4	27/64	1 21/32	2 1/2	1 21/32	3	3 1/4	3 1/4	3 1/4	3 1/2	3 1/2	4 1/8
1 1/2	31/64	1 29/32	2 7/8	1 29/32	3 3/8	3 3/4	3 3/4	3 3/4	3 7/8	3 7/8	4 5/8
2	5/8	2 3/8	3 5/8	2 3/8	4 1/8	4 3/8	4 3/8	4 3/8	5 5/8	5 5/8	5 3/4
2 1/2	5/8	2 7/8	4 1/8	2 7/8	4 7/8	5 1/8	5 1/8	5 1/8	6 1/2	6 1/2	6 5/8
3	3/4	3 1/2	5	3 1/2	5 3/8	5 7/8	5 7/8	5 7/8	6 5/8	6 7/8	7 3/4
3 1/2	3/4	4	5 1/2	4	6 3/8	6 1/2	6 3/8	6 3/8			
4	27/32	4 1/2	6 3/16	4 1/2	6 7/8	7 1/8	7	7 5/8	8 1/8	8 1/4	9 1/4
5	7/8	5 9/16	7 5/16	5 9/16	7 3/4	8 1/2	8 3/8	9 1/2	9 3/4	10	11
6	15/16	6 5/8	8 1/2	6 5/8	8 3/4	9 7/8	9 3/4	10 1/2	11 3/8	11 1/8	12 1/2
8	1	8 5/8	10 5/8	8 5/8	11	12 1/8	12	12 5/8	14 1/8	13 7/8	15 1/4
10	1	10 3/4	12 3/4	10 3/4	13 3/8	14 1/4	14 1/8	15 3/4	17 1/8	17 1/8	18 3/4
12	1 1/8	12 3/4	15	12 3/4	16 1/8	16 5/8	16 1/2	18	19 5/8	20 1/2	21 5/8
14	1 1/8	14	16 1/4	14	17 3/4	19 1/8	19	19 3/8	20 1/2	22 3/4	
16	1 1/4	16	18 1/2	16	20 1/4	21 1/4	21 1/8	22 1/4	22 5/8	25 1/4	
18	1 1/2	18	21	18	21 5/8	23 1/2	23 3/8	24 1/8	25 1/8	27 3/4	
20	1 1/2	20	23	20	23 7/8	25 3/4	25 1/2	26 7/8	27 1/2	29 3/4	
24	1 5/8	24	27 1/4	24	28 1/4	30 1/2	30 1/4	31 1/8	33	35 1/2	

†Applies to both Fig. 1 and Fig. 2. Gasket diameters may be varied, provided the gasket contact width does not exceed that shown; in no case, however, should the area of non-metallic gaskets be less than that of the bolts.

*Gasket may be extended or a centering ring used.

As ESTABLISHED in American Standards Association B16.5-1953, Class A ratings apply to the following facing gasket combinations:

a) Ring type joint.

b) Small tongue and groove facing used with any type gasket.

c) Large tongue and groove facing used with any type gasket, except flat solid metal.

d) Other facings with gaskets which result in no increase in bolt load or flange moment over those resulting from the facing gasket combinations listed in *a* through *c* above.

Class B ratings apply to standard facings with gaskets not included in Class A ratings.

Meets Class A Requirements

Steel flanges are generally used with raised faces. The B16.5 Class A gasket provision d gives a means of obtaining Class A ratings for flanges with raised faces. But the bolt load and moment calculations required by provision d are time con-

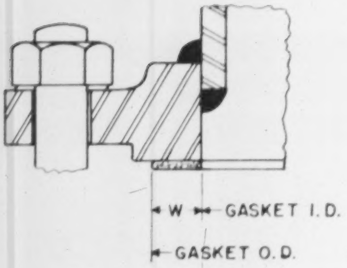

Fig. 3

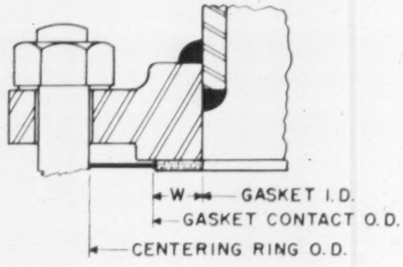

Fig. 4

Table 2a **Group IIa Gaskets**

	W	Fig. 3		Fig. 4								
						Centering Ring Outside Diameter, in.						
Nominal Size, in.	Gasket Contact Width, in.†	Inside Diameter, in.	Outside Diameter, in.	Inside Diameter, in.	Gasket Contact Outside Diameter	150 lb	300 lb	400 lb	600 lb	900 lb	1500 lb	2500 lb
1/2	3/16	27/32	1 7/32	27/32	1 7/32	1 7/8	2 1/8	2 1/8	2 1/8	2 1/2	2 1/2	2 3/4
3/4	3/16	1 1/16	1 7/16	1 1/16	1 7/16	2 1/4	2 5/8	2 5/8	2 5/8	2 3/4	2 3/4	3
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3	3/8	3 1/2	4 1/4	3 1/2	4 1/4	5 3/8	5 7/8	5 7/8	5 7/8	6 5/8	6 7/8	7 3/4
3 1/2	3/8	4	4 3/4	4	4 3/4	6 3/8	6 1/2	6 3/8	6 3/8	....	....	....
4	1/2	4 1/2	5 1/2	4 1/2	5 1/2	6 7/8	7 1/8	7	7 5/8	8 1/8	8 1/4	9 1/4
5	1/2	5 9/16	6 9/16	5 9/16	6 9/16	7 3/4	8 1/2	8 3/8	9 1/2	9 3/4	10	11
6	1/2	6 5/8	7 5/8	6 5/8	7 5/8	8 3/4	9 7/8	9 3/4	10 1/2	11 3/8	11 1/8	12 1/2
8	5/8	8 5/8	9 7/8	8 5/8	9 7/8	11	12 1/8	12	12 5/8	14 1/8	13 7/8	15 1/4
10	3/4	10 3/4	12 1/4	10 3/4	12 1/4	13 3/8	14 1/4	14 1/8	15 3/4	17 1/8	17 1/8	18 3/4
12	3/4	12 3/4	14 1/4	12 3/4	14 1/4	16 1/8	16 5/8	16 1/2	18	19 5/8	20 1/2	21 5/8
14	3/4	14	15 1/2	14	15 1/2	17 3/4	19 1/8	19	19 3/8	20 1/2	22 3/4	....
16	7/8	16	17 3/4	16	17 3/4	20 1/4	21 1/4	21 1/8	22 1/4	22 5/8	25 1/4	....
18	7/8	18	19 3/4	18	19 3/4	21 5/8	23 1/2	23 3/8	24 1/8	25 1/8	27 3/4	....
20	1	20	22	20	22	23 7/8	25 3/4	25 1/2	26 7/8	27 1/2	29 3/4	....
24	1	24	26	24	26	28 1/4	30 1/2	30 1/4	31 1/8	33	35 1/2	....

†Applies to both Fig. 3 and Fig. 4. Gasket diameters may be varied, provided the gasket contact width does not exceed that shown.

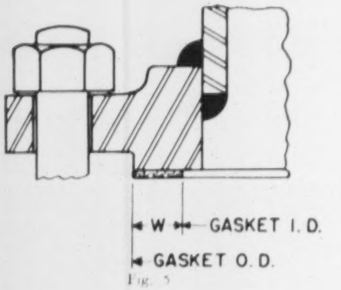


Fig. 5

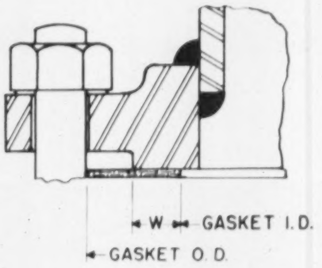


Fig. 6

Table 2b **Group IIb Gaskets**

	W	Fig. 5		Fig. 6							
					Outside Diameter, in.*						
Nominal Size, in.	Gasket Contact Width in.†	Inside Diameter, in.	Outside Diameter, in.	Inside Diameter, in.	150 lb	300 lb	400 lb	600 lb	900 lb	1500 lb	2500 lb
1/2	3/16	1	1 3/8	1	1 7/8	2 1/8	2 1/8	2 1/8	2 1/2	2 1/2	2 3/4
3/4	3/16	1 5/16	1 11/16	1 5/16	2 1/4	2 5/8	2 5/8	2 5/8	2 3/4	2 3/4	3
1	1/4	1 1/2	2	1 1/2	2 5/8	2 7/8	2 7/8	2 7/8	3 1/8	3 1/8	3 3/8
1 1/4	5/16	1 7/8	2 1/2	1 7/8	3	3 1/4	3 1/4	3 1/4	3 1/2	3 1/2	4 1/8
1 1/2	3/8	2 1/8	2 7/8	2 1/8	3 3/8	3 3/4	3 3/4	3 3/4	3 7/8	3 7/8	4 5/8
2	3/8	2 7/8	3 5/8	2 7/8	4 1/8	4 3/8	4 3/8	4 3/8	5 5/8	5 5/8	5 3/4
2 1/2	3/8	3 3/8	4 1/8	3 3/8	4 7/8	5 1/8	5 1/8	5 1/8	6 1/2	6 1/2	6 5/8
3	3/8	4 1/4	5	4 1/4	5 3/8	5 7/8	5 7/8	5 7/8	6 5/8	6 7/8	7 3/4
3 1/2	3/8	4 1/4	5 1/2	4 3/4	6 3/8	6 1/2	6 3/8	6 3/8	....	....	....
4	1/2	5 3/16	6 3/16	5 3/16	6 7/8	7 1/8	7	7 5/8	8 1/8	8 1/4	9 1/4
5	1/2	6 5/16	7 5/16	6 5/16	7 3/4	8 1/2	8 3/8	9 1/2	9 3/4	10	11
6	1/2	7 1/2	8 1/2	7 1/2	8 3/4	9 7/8	9 3/4	10 1/2	11 3/8	11 1/8	12 1/2
8	5/8	9 3/8	10 5/8	9 3/8	11	12 1/8	12	12 5/8	14 1/8	13 7/8	15 1/4
10	3/4	11 1/4	12 3/4	11 1/4	13 3/8	14 1/4	14 1/8	15 3/4	17 1/8	17 1/8	18 3/4
12	3/4	13 1/2	15	13 1/2	16 1/8	16 5/8	16 1/2	18	19 5/8	20 1/2	21 5/8
14	3/4	14 3/4	16 1/4	14 3/4	17 3/4	19 1/8	19	19 3/8	20 1/2	22 3/4	....
16	7/8	16 3/4	18 1/2	16 3/4	20 1/4	21 1/4	21 1/8	22 1/4	22 5/8	25 1/4	....
18	7/8	19 1/4	21	19 1/4	21 5/8	23 1/2	23 3/8	24 1/8	25 1/8	27 3/4	....
20	1	21	23	21	23 7/8	25 3/4	25 1/2	26 7/8	27 1/2	29 3/4	....
24	1	25 1/4	27 1/4	25 1/4	28 1/4	30 1/2	30 1/4	31 1/8	33	35 1/2	....

†Applies to both Fig. 5 and Fig. 6. Gasket diameters may be varied, provided the gasket contact width does not exceed that shown.
*Gasket may be extended or a centering ring used.

suming and open to varying interpretations. Consequently, soon after the issuance of ASA B16.5 a demand developed for a Standard Practice which would establish the dimensions of gaskets usable with raised face flanges and suitable for Class A ratings. So the Ferrous Flange Committee of the Manufacturers' Standardization Society of the Valve and Fittings Industry appointed a task force to develop such a Standard Practice.

Task Force Develops Practice

First, calculations were made of the bolt load and flange moments of the facing gasket combinations listed in ASA B16.5 Class A gasket provisions a, b, and c, using the same method as used in establishing ASA B16.5 ratings. This is essentially the calculation method given in the American Society of Mechanical Engineers' Unfired Pressure Vessels Code (1952), Appendix II. Then, gasket dimensions for raised face flanges were established so that the resulting calculated bolt loads and flange moments did not significantly exceed — i.e., by more than 10 percent — those of corresponding existing Class A facing gasket combinations.

The resulting Standard Practice, entitled "Limiting Dimensions of Raised Face Flange Gaskets Which Meet Requirements of ASA B16.5 Class A Ratings," was approved by the Manufacturers' Standardization Society of the Valve and Fittings Industry in September 1955 and was issued as SP47.

Define Gasket Construction

The gasket materials and construction covered by SP47 are defined in the ASME Unfired Pressure Vessels Code (1952), Table UA 47.1. For standardization purposes, the gaskets were divided into three groups based on their properties as indicated by their *m* and *y* factors given in the

ASME Code. The three groups were defined as follows:

Group	m	y
I	3.00 or smaller	4500 or smaller
II	over 3.00 to 4.25	over 4500 to 10,100
III	over 4.25	over 10,100

The *m* factor is the required ratio of the residual gasket stress to the operating pressure when the flange bolts are tightened to the specified bolt stress and operating pressure is applied. The *y* factor is the gasket stress required to seat the gasket under bolting-up conditions with no internal pressure. Both of these factors are related to a gasket contact area which is usually about one-half of the actual gasket contact area. For detailed definition of the factors, refer to the ASME Code.

Gasket Dimensions Given

The gasket dimensions given in MSS SP47 for gasket Groups I, II, and III, are shown in Tables 1, 2, and 3, respectively. The gasket contact widths are as follows:

Group I: ASA B16.5 slip-on flange raised face width.

Group II: ASA B16.5 large tongue width.

Group III: ASA B16.5 small tongue width minus 1/32 in., but not less than 3/16 in.

It should be noted that ASA Standard flange facings are the same for all series and types of flanges; e.g. a 6 in., 150 lb slip-on flange has the same raised face outside diameter as a 6 in., 2500 lb welding neck flange. Generally speaking, Group II gaskets are about two-thirds and Group III gaskets are about one-third the width of the corresponding size Group I gaskets.

Since Group II and III gaskets do not cover the entire width of the raised face, the question arises whether it is preferable to place the gasket close to the bore or close to the outside diameter of the raised

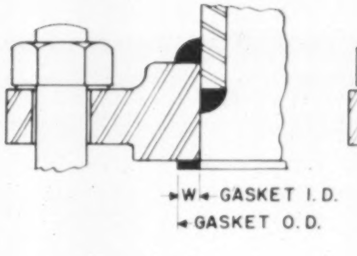


Fig. 7

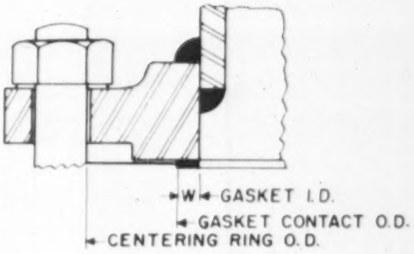


Fig. 8

Table 3a **Group IIIa Gaskets**

Nominal Size, in.	W Gasket Contact Width, in.†	Fig. 7 Inside Diameter, in.	Fig. 7 Outside Diameter, in.	Fig. 8 Inside Diameter, in.	Fig. 8 Gasket Contact Outside Diameter, in.	Centering Ring Outside Diameter, in. 150 lb	300 lb	400 lb	600 lb	900 lb	1500 lb	2500 lb
1/2	3/16	23/32	1 3/32	23/32	1 3/32	1 7/8	2 1/8	2 1/8	2 1/8	2 1/2	2 1/2	2 3/4
3/4	3/16	1 1/16	1 7/16	1 1/16	1 7/16	2 1/4	2 5/8	2 5/8	2 5/8	2 3/4	2 3/4	3
1	3/16	1 5/16	1 11/16	1 5/16	1 11/16	2 5/8	2 7/8	2 7/8	2 7/8	3 1/8	3 1/8	3 3/8
1 1/4	3/16	1 21/32	2 1/32	1 21/32	2 1/32	3	3 1/4	3 1/4	3 1/4	3 1/2	3 1/2	4 1/8
1 1/2	3/16	1 29/32	2 9/32	1 29/32	2 9/32	3 3/8	3 3/4	3 3/4	3 3/4	3 7/8	3 7/8	4 5/8
2	3/16	2 3/8	2 3/4	2 3/8	2 3/4	4 1/8	4 3/8	4 3/8	4 3/8	5 5/8	5 5/8	5 3/4
2 1/2	3/16	2 7/8	3 1/4	2 7/8	3 1/4	4 7/8	5 1/8	5 1/8	5 1/8	6 1/2	6 1/2	6 5/8
3	3/16	3 1/2	3 7/8	3 1/2	3 7/8	5 3/8	5 7/8	5 7/8	5 7/8	6 5/8	6 7/8	7 3/4
3 1/2	3/16	4	4 3/8	4	4 3/8	6 3/8	6 1/2	6 3/8	6 3/8	....	....	....
4	7/32	4 1/2	4 15/16	4 1/2	4 15/16	6 7/8	7 1/8	7	7 5/8	8 1/8	8 1/4	9 1/4
5	7/32	5 9/16	6	5 9/16	6	7 3/4	8 1/2	8 5/8	9 1/2	9 3/4	10	11
6	7/32	6 5/8	7 1/16	6 5/8	7 1/16	8 3/4	9 7/8	9 3/4	10 1/2	11 3/8	11 1/8	12 1/2
8	9/32	8 5/8	9 3/16	8 5/8	9 3/16	11	12 1/8	12	12 5/8	14 1/8	13 7/8	15 1/4
10	11/32	10 3/4	11 7/16	10 3/4	11 7/16	13 3/8	14 1/4	14 1/8	15 1/4	17 1/8	17 1/8	18 3/4
12	11/32	12 3/4	13 7/16	12 3/4	13 7/16	16 1/8	16 5/8	16 1/2	18	19 5/8	20 1/2	21 5/8
14	11/32	14	14 11/16	14	14 11/16	17 3/4	19 1/8	19	19 3/8	20 1/2	22 3/4	....
16	13/32	16	16 13/16	16	16 13/16	20 1/4	21 1/4	21 1/8	22 1/4	22 5/8	25 1/4	....
18	13/32	18	18 13/16	18	18 13/16	21 5/8	23 1/2	23 3/8	24 1/8	25 1/8	27 3/4	....
20	13/32	20	20 13/16	20	20 13/16	23 7/8	25 3/4	25 1/2	26 7/8	27 1/2	29 3/4	....
24	13/32	24	24 13/16	24	24 13/16	28 1/4	30 1/2	30 1/4	31 1/8	33	35 1/2	....

†Applies to both Fig. 7 and Fig. 8. Gasket diameters may be varied, provided the gasket contact width does not exceed that shown.

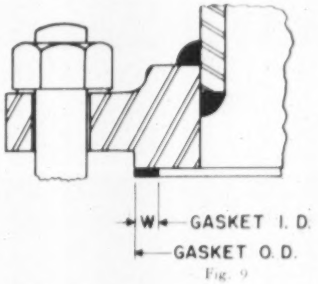


Fig. 9

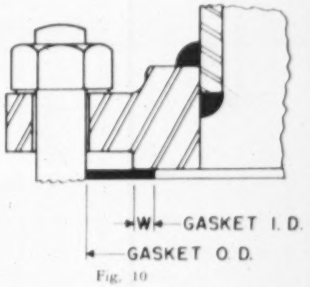


Fig. 10

Table 3b **Group IIIb Gaskets**

Nominal Size, in.	W Gaskets Contact Width in.†	Fig. 9 Inside Diameter, in.	Fig. 9 Outside Diameter, in.	Fig. 10 Inside Diameter, in.	Outside Diameter, in.* 150 lb	300 lb	400 lb	600 lb	900 lb	1500 lb	2500 lb
1/2	3/16	1	1 3/8	1	1 7/8	2 1/8	2 1/8	2 1/8	2 1/2	2 1/2	2 3/4
3/4	3/16	1 5/16	1 11/16	1 5/16	2 1/4	2 5/8	2 5/8	2 5/8	2 3/4	2 3/4	3
1	3/16	1 5/8	2	1 5/8	2 5/8	2 7/8	2 7/8	2 7/8	3 1/8	3 1/8	3 3/8
1 1/4	3/16	2 1/8	2 1/2	2 1/8	3	3 1/4	3 1/4	3 1/4	3 1/2	3 1/2	4 1/8
1 1/2	3/16	2 1/2	2 7/8	2 1/2	3 3/8	3 3/4	3 3/4	3 3/4	3 7/8	3 7/8	4 5/8
2	3/16	3 1/4	3 5/8	3 1/4	4 1/8	4 3/8	4 3/8	4 3/8	5 5/8	5 5/8	5 3/4
2 1/2	3/16	3 3/4	4 1/8	3 3/4	4 7/8	5 1/8	5 1/8	5 1/8	6 1/2	6 1/2	6 5/8
3	3/16	4 5/8	5	4 5/8	5 3/8	5 7/8	5 7/8	5 7/8	6 5/8	6 7/8	7 3/4
3 1/2	3/16	5 1/8	5 1/2	5 1/8	6 3/8	6 1/2	6 3/8	6 3/8	....	....	....
4	7/32	5 3/4	6 3/16	5 3/4	6 7/8	7 1/8	7	7 5/8	8 1/8	8 1/4	9 1/4
5	7/32	6 7/8	7 5/16	6 7/8	7 3/4	8 1/2	8 5/8	9 1/2	9 3/4	10	11
6	7/32	8 1/16	8 1/2	8 1/16	8 3/4	9 7/8	9 3/4	10 1/2	11 3/8	11 1/8	12 1/2
8	9/32	10 1/16	10 5/8	10 1/16	11	12 1/8	12	12 5/8	14 1/8	13 7/8	15 1/4
10	11/32	12 1/16	12 3/4	12 1/16	13 3/8	14 1/4	14 1/8	15 1/4	17 1/8	17 1/8	18 3/4
12	11/32	14 5/16	15	14 5/16	16 1/8	16 5/8	16 1/2	18	19 5/8	20 1/2	21 5/8
14	11/32	15 9/16	16 1/4	15 9/16	17 3/4	19 1/8	19	19 3/8	20 1/2	22 3/4	....
16	13/32	17 11/16	18 1/2	17 11/16	20 1/4	21 1/4	21 1/8	22 1/4	22 5/8	25 1/4	....
18	13/32	20 3/16	21	20 3/16	21 5/8	23 1/2	23 3/8	24 1/8	25 1/8	27 3/4	....
20	13/32	22 3/16	23	22 3/16	23 7/8	25 3/4	25 1/2	26 7/8	27 1/2	29 3/4	....
24	13/32	26 7/16	27 1/4	26 7/16	28 1/4	30 1/2	30 1/4	31 1/8	33	35 1/2	....

†Applies to both Fig. 9 and Fig. 10. Gasket diameters may be varied, provided the gasket contact width does not exceed that shown.
*Gasket may be extended or a centering ring used.

face. Bolt load and flange moment calculations indicate little difference between these alternate locations. The increase in gasket area as the mean gasket diameter increases is about compensated for by the decrease in the load moment arms. Some users prefer that such gaskets be kept close to the bore, reasoning that the pressure area is thereby kept to a minimum and the flexibility of the flange joint — which is helpful in resisting loads due to temperature differentials within the flanged joint — is kept at a maximum. Other users prefer to locate the gasket so that it can be centered with the outside of the raised face and reason that, with such a gasket, overloading of the flange by excessive initial bolt tightening is less likely, due to the decreased bolt load lever arms. The MSS Standard Practice gives gasket dimensions for both alternates. Provisions are included to permit gasket diameter variations which make possible any intermediate condition the user may prefer. It is suggested, however, that users select gaskets from the tabulated dimensions so that gasket manufacturers may stock and furnish standard gaskets.

Group I gaskets with edges extending to the bolts — Fig. 1 — are dimensionally the same as the corresponding flat ring gaskets established in ASA B16.21-1951, "Nonmetallic Gaskets for Pipe Flanges."

As pointed out in MSS SP47, the tabulated gasket dimensions represent approximately the maximum combinations of widths and diameters which meet Class A flange rating requirements. Variations in dimensions which tend to reduce bolt loads and flange moments — e.g., reducing the gasket width — may be made. However, in departing from the tabulated dimensions, consideration should be given to the stability of the gasket under higher bolt loadings. As a general rule, the contact area of nonmetallic gaskets should not be less than the bolt area.

Class A gaskets include flat iron or steel gaskets in Group III. While such gaskets are excellent once an adequate initial seat between flange faces and gaskets is obtained, the writer's experience indicates that the initial seat is difficult to obtain with 150 lb flanges. Hence, flat iron or steel gaskets with 150 lb flanges should be avoided.

Assume that a carbon steel piping system is to be installed for a pressure of 700 psi at 100 F. These assumed operating conditions are above 300 lb Class B ratings — 600 psi at 100 F — but are below 300 lb Class A ratings — 720 psi at 100 F. Under former ASA B16e-1949, it would have been necessary either to use 300 lb flanges, flanged fittings, and valves with relatively expensive ring type joint or to use 400 lb components with standard facing. Under ASA B16.5 and using gaskets in accordance with MSS SP 47, however, 300 lb components with raised faces may be used with large savings.⌗

How Ratings Were Developed

Since 1927, steel pipe flange dimensions and their allowable working pressures have been established by the American Standards Association, the current standard being ASA B16.5-1953. These ratings are made part of the American Society of Mechanical Engineers' Boiler Construction Code and the ASA Code for Pressure Piping. Accordingly, the piping contractor and engineer who deals with such Code piping is governed in the selection of steel flanges by the ratings given in ASA B16.5.

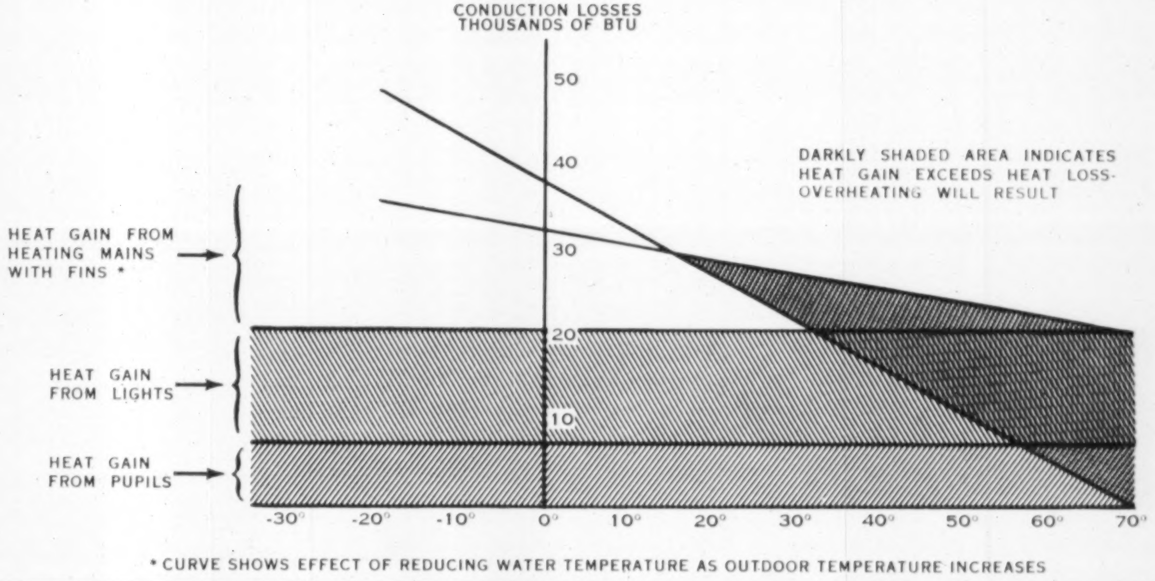
The ratings established in ASA B16.5 differ from its predecessor standard, ASA B16e6-1949, in several important respects, one of which is the redefining of the two rating classes which are dependent upon the facing gasket combination of the flanged joint. The new standard enables higher ratings to be assigned to raised face flanges provided the gaskets meet certain provisions. Dimensions of gaskets meeting these provisions have been tabulated in the recently issued Standard Practice SP 47 of the Manufacturers' Standardization Society of the Valve and Fittings Industry.

It pays piping engineers and contractors to be well acquainted with MSS SP47 since it will, for certain working pressures and temperatures, permit the use of more economical steel flanges and valves.

Between the first edition of the ASA steel flange standard in 1927 and the 1953 edition, flange ratings have been periodically reexamined in light of accumulated experience and improved analytical methods of flange design. As a result, it has been found possible to increase the original flange ratings. During the same period, ratings have been extended to cover a widely diversified group of flange types, materials, and gasket facing combinations.

In the 1939 edition, two separate ratings were introduced, one for standard faces as had been used in the past and a second for the comparatively new ring type joint. The ring type joint ratings were generally around 20 percent higher than ratings for standard faces.

During the six years preceding the completion of the 1953 standard, a large volume of analytical work was completed on stresses in ASA flanges with various types of gaskets, based on the flange calculation procedure given in the ASME Unfired Pressure Vessels Code. These calculations led to the conclusion that standard faces with certain gaskets could also be given the higher ratings assigned to ring type joint flanges. Accordingly, the 1953 edition of the ASA steel flange standard established ratings for two classes of gaskets: Class A, having ratings paralleling the former ring type joint ratings; Class B, having ratings paralleling the former standard facing ratings.



CUMULATIVE HEAT GAIN from pupils, lights, and finned pipe in a typical modern classroom shows that the problem is more one of cooling than heating

Why Are Many Classrooms Overheated?

The overheated classroom need not exist, says the author, if careful consideration is given the problem of cooling versus heating, and if the system is designed, controlled, and installed in the full light of modern knowledge and equipment.

By J. R. Fuller

Manager,
Unit Ventilator Dept.
The Trane Co.

IN MY WORK with school boards, I've frequently encountered the query: "Why are the classrooms in our school overheated?" If the schools in question were older schools where the heating and ventilating systems were conceded to be outmoded, our concern would not be so great. But this is not the case. The questioner is often referring to a new school, theoretically modern in every respect. Yet, in this otherwise modern school, discomfort conditions exist. Classroom temperatures, even on cold winter days, may exceed thermostat settings most of the time classes are in session.

The problem of the too-warm classroom is a serious one for three reasons:

1) It is not a proper place to study. Research has established that a child's ability to learn decreases rapidly as temperatures rise above the usual 70 to 72 F.

2) The overheated classroom represents a wasteful expenditure of much needed school funds. It indicates, in most cases, that the original cost of the heating system was higher than it needed to be. It obviously means that fuel dollars are being wasted.

3) Once the school building is completed, it is practically impossible to correct the condition of the overheated classroom without exorbitant costs.

While the overheated classroom, once a fact, is almost impossible to satisfactorily correct, it can be avoided. In the light of present knowledge, with proper engineering and good design, and by making use of the latest advancements in construction methods, the overheated classroom can be prevented.

Calculating Design Temperature

As a matter of familiar history among engineers, comparatively recent data compiled by Federal agencies and other interested groups has provided the basis for determining a design temperature which today is widely accepted. This design temperature is defined as "that outside temperature which is equaled or exceeded 97½ of the hours during December, January, February, and March." This design temperature is usually several degrees higher than the "common use" temperature, previously used.

This method of calculating design temperature is fine for most buildings. Heating equipment is sized to compensate for the total heat loss. However, schools should be treated differently, in my opinion. Factors unique to the school that cause excessive heat gain should be allowed for in a properly designed school heating system.

School classrooms create a separate and distinct comfort problem, really more of an air conditioning problem than a heating problem. As we will see later, classrooms call for more cooling than heating, even in winter months.

Consider Heat Losses, Gains

To properly evaluate the cause of overheating, let us look at heat losses and heat gains in a hypothetical classroom. Assume that this room is in a school in the northern U.S. It is 22 ft wide, 36 ft long, and 9½ ft high, with 270 sq ft of window area. The construction of the room is such that at an outside temperature of −20 F and a desired inside temperature of 72 F, the normal amount of heat lost from the room to the outside is 48,000 Btu per hr.

It is elementary that if the outdoor temperature changes, so does the amount of heat that must be brought into the room. Obviously, the heating equipment must be sized sufficiently large to provide enough heat to maintain the room at comfort conditions in the coldest weather. But, because the heating equipment is often sized to compensate for the total heat loss, plus various safety factors, it is one of the major causes of overheating.

Pupils and lights are important sources of heat which should be carefully considered. In a typical classroom, there will probably be a minimum of 30 pupils whenever class is in session. Each of them will be giving off heat at all times. The exact amount will vary according to age, activity, sex, and other factors, but a conservative estimate is 250 Btu per hr per pupil. Multiply this by 30, the number of pupils, and we get a total of 7500 Btu added to the room each hour by the pupils alone. If the outside temperature is down to our design temperature of −20 F, the pupils themselves are adding more than 15 percent of the total heat required to maintain the classroom at the desired 72 F.

With a design temperature of −20 F, the *average* winter temperature for this locality would be approximately 30 F. At the average winter temperature of +30 F, our typical classroom would lose only 21,000 Btu to the outside instead of 48,000. The amount of heat given off by the pupils remains constant at 7500 Btu, but at the average winter temperature this amounts to 35 percent of the total amount of heat the room required.

Remember, the 30 F figure used is the average of day and night temperature readings during the winter months. During the day, when classes are in session, the temperature may be considerably higher. So it is safe to say that during the heating season, pupils in the classroom provide one-third of the heat they need to remain comfortable during a fair amount of the winter class time.

Lighting also adds to the heat gain. It is generally conceded that sunlight streaming through the enlarged window area, through glass block construction, and through carefully designed skylights, often provides the classroom with a bright and cheerful atmosphere. But artificial lighting in abundance is still needed almost constantly to avoid unbalanced lighting and the resultant eye strain.

To provide proper balanced lighting in a typical classroom, approximately 4000 watts of light are required. Fluorescent or incandescent lights add heat to the room at the rate of 3.4 Btu per watt per hr, or a total of 13,600 Btu per hr.

At the design temperature of −20 F, it represents more than 28 percent of the total heat required. At the average winter temperature of 30 F, it represents 65 percent of the total.

Pupils, Lights Half of Gain

At the −20 F design temperature, the pupils and lights provide 44 percent of the total heat required. At the average winter temperature of 30 F, these two sources alone will give off 22,100 Btu per hr. 1100 more Btu than the room requires to maintain its desired temperatures. Therefore, on the basis of heat lost to the outside, the heat from the pupils and the lights could overheat the classroom whenever outside temperatures are 30 F or over. Even in the coldest parts of the U.S., this temperature will be equaled or exceeded during a large part of the time the classrooms are in session in October through April.

Out of 48 recording stations in the extreme northern tier of states, 31 report average temperatures higher than 30 F for these months. In other words, 50 percent of the time, the temperature is higher than 30 F. It becomes apparent that the pupils and the lights alone will overheat our typical classroom during much of the winter.

These two sources of heat are positive and practically constant whenever the class is in session. Therefore, their values should be considered carefully in the design of the heating system.

Solar Heat Gain Greatest

There is a third source of heat — the sun — which, because it is neither positive nor constant, cannot be depended upon in calculating heat gains within a room. It does, however, present definite problems of maintaining comfort conditions. Direct sunlight, if it were streaming through the large window area, would add heat to the room at an enormous rate. Naturally, on cloudy or heavily overcast days, this rate of heat transfer is materially reduced. Recent tests have proved, however, that the total amount of heat is substantial even on cloudy days, even in rooms with northern exposures, because of reflected sun rays.

At the peak, heat gain from the sun would amount approximately to 180 Btu per hr per sq ft of glass. In our hypothetical classroom, in which we allow 270 sq ft of glass area, if we assume arbitrarily a 100 Btu per hr per sq ft of glass heat gain, we have a total solar heat gain of 100 × 270 sq ft, or 27,000 Btu per hr through the windows. Combined with the heat from the light and pupils, this solar heat input would be more than enough to maintain the room at desired temperatures even at the design temperature of −20 F.

In designing the school, plans must be made to reduce the effect of the sun load. Proper building orientation, use of roof overhangs, venetian blinds or awnings are all methods of holding the solar heat effect to a minimum. Even so, the effect of the sun shining through the windows and, of course, the effect of the sun on the walls and roof is a major contribution to classroom overheating. Because it is not constant, this heat gain cannot be used to bring about a reduction in the size of the heating system, but steps must be taken to provide the cooling required to compensate for it.

Uninsulated Pipes Warm Room

Still another cause of overheating is the uninsulated heating pipes that pass through some rooms and constantly radiate uncontrollable heat during the winter. The problem has been solved in many cases by insulating the piping, or rerouting it.

Instead of removing this problem by the forementioned methods, however, some schools are being designed with heating systems that accentuate it. In attempts to economize on construction and stop the drafts from large school windows, hot water heating systems are being installed today in which the supply and return lines are run around the perimeter of the building. In these instances, the heating units are connected in series. There is nothing peculiar about this, but the mains in some of these systems are not only uninsulated but equipped with fins to increase heat transfer. These finned pipes will deliver between 350 and 450 Btu per lineal foot, even with reduced hot water temperatures.

The average classroom might have 25 ft of finned heat main. If we multiply this by the heat transfer per lineal foot we find a room heat gain of approximately 10,000 Btu. This tremendous heat gain alone is more than can be compensated for by ordinary ventilation.

The cumulative effect of heat gain from pupils lights, and finned pipe within the room is shown in the chart at the beginning of the article. In the light of this knowledge, it is inescapable that in the modern occupied classroom the problem is one of cooling more than heating. This is true even though the outside temperature may be in the range of zero F.

Why Good Ventilation Needed

To cool the classroom, there is a minimum temperature and a maximum volume at which ventilation air may be introduced without producing drafts. Tests prove that 55 F is the minimum temperature for ventilation air. Below this, uncomfortable drafts result. The normal low temperature control point is 60 F. The maximum volume of air that may be introduced into the average classroom is 750 cfm, or six air changes per hr.

The cooling effect can be calculated as follows: 750 cfm × 1.085 × room temperature − ventilation air temperature. If our room temperature is 72 F and ventilation air is introduced at 60 F, the cooling effect is 750 cfm × 1.085 × 72 F − 60 F, or 9765 Btu. This cooling effect is significant because it is less than the heat gain from lights and less than the heat gain from finned heat mains. It exceeds only the heat gain from pupils. But none of these heat gains exists alone as they are cumulative.

Ordinary ventilation cannot take care of the excessive heat gain if these factors have not been considered before the equipment is installed. Good mechanical ventilation is the only answer for proper classroom cooling. It provides controlled amounts of ventilation air all the time the room is occupied.

Since our problem is more one of cooling than heating, auxiliary heating units can be safely eliminated from the system in all but the most severely exposed classrooms. ‡

Pipe Helium-Oxygen Into Offices, Schools

. . . inventor suggests

A "HELIUMIZED office that would make you a more efficient thinker" is the newest idea advanced by the inventor of the famous Momsen lung, Vice Admiral (Retired), Charles B. Momsen.

The Admiral thinks it would be practical to pipe a helium-oxygen mixture — the same combination which enables deep sea divers to work more efficiently and with less fatigue — into offices, schools, hospital operating rooms, and other places where a high level of mental activity is expected.

Admiral Momsen believes that in the $He\text{-}O_2$ atmosphere, you might work 12 hours a day without fatigue, and the increased efficiency of your brain might enable you to do six hours work in four. Transition from a heliumized office to a normal atmosphere might make you feel as though you've had a drink or two, but the effect will not last as long.

Admiral Momsen's earlier development, the Momsen lung, circulates exhaled air through a purifying agent, permitting it to be inhaled again. ‡

By Francis H. Buzzard

Associate of
Charles S. Leopold, Engineer

Adverse temperature and humidity conditions once "welcomed" crowds in this 26 year old municipal auditorium before a varied, composite 1500 ton system was installed to . . .

Condition Convention Hall for

THE INSTALLATION of a 1500 ton air conditioning system, recently completed, in Philadelphia's Convention Hall marks the first step of a $3 million improvement program to make the Hall and four associated buildings on the site a foremost trade and civic center. Constructed in 1930 as the city's municipal auditorium, the famous Hall is one of America's largest auditoriums. It has been host to several political conventions and many nationally prominent meetings.

Some of the original ventilation equipment and provisions for future air conditioning which were incorporated in the original project were utilized as far as possible in the final air conditioning design.

Systems are installed to permit the arena, exhibition hall and ballroom to be used separately or jointly. Other areas, such as the lobbies, concourses, restaurants, back stage dressing rooms, stage, and groups of meeting rooms are provided with separate systems so that it is not necessary to operate the entire system to condition a portion of the structure.

The total air conditioned space is 202,500 sq ft, which includes the arena balcony. The system is designed for peak loads of 18,700 people, 920 kw, and a peak refrigeration load of 1753 tons.

The largest areas and the three largest meeting rooms and their respective occupancies are as follows:

	Area sq ft	Occupancy
1) Arena, including balcony	81,000	16,000
2) Exhibition hall	36,650	3,000
3) Ballroom	6,400	1,000
4) Three large meeting rooms, total	5,500	600

The outside conditions are based on 95 F DB, 78 F WB, maintaining within the conditioned areas 78 F and 50 percent relative humidity. Daytime peak loads are anticipated.

For the arena there are six supply systems and six return-relief systems handling 565,000 cfm. To keep the appearance of tobacco smoke within acceptable limits, it would be necessary to supply over 20 cfm of smoke-free air per person. If this were all outdoor air, it would result in a prohibitive refrigeration load.[1] The design of the arena apparatus, therefore, includes electrostatic filters, and the outdoor air is reduced to that normally required for ventilation.

For the other main areas: the exhibition hall has two supply systems and two return-relief systems handling 145,000 cfm; the ballroom has one supply and one return-relief system handling 38,500 cfm; and the three meeting rooms have one supply and one return-relief system handling 22,500 cfm.

Equipment Room in Basement

In the basement there are installed three centrifugal refrigeration machines. Each machine has a rating of 500 tons driven by a 500 hp slip ring motor. The three machines provide for flexibility of operation in that if only the arena is used at peak capacity, two machines are required. When the entire building is occupied, three are required. If only the exhibition hall is used or the ballroom and some of the smaller areas, then one machine is used.

The starters are placed on one side of the refrigeration room so that they can be operated and observed at this central location.

The chilled water is circulated by three centrifugal pumps circulating 5610 gpm. These pumps are connected into a main chilled water header connecting to all machines. This permits the operation of any

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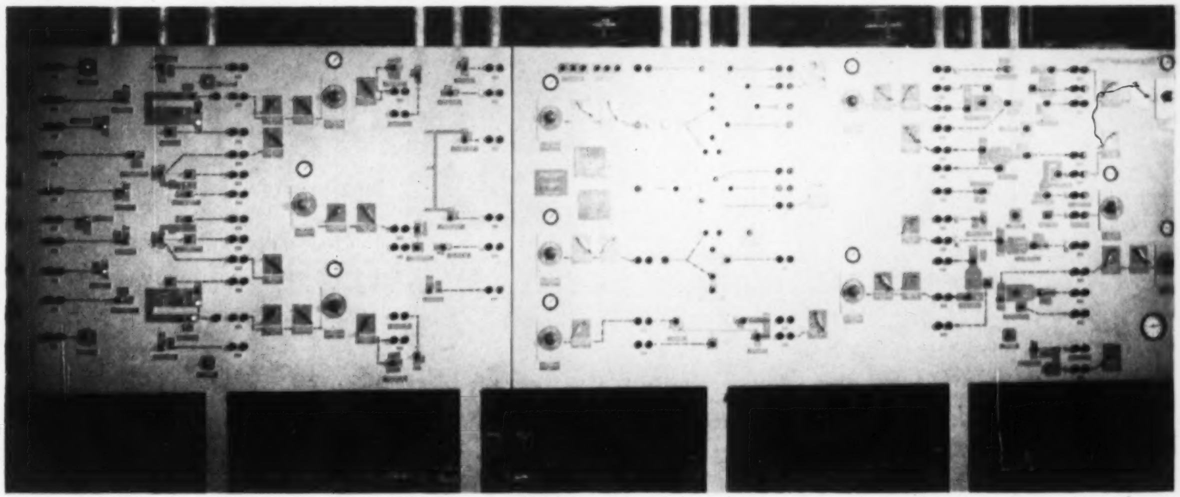
[1] "Tobacco Smoke Control—A Preliminary Study," by Charles S. Leopold, ASHVE Transactions, Vol. 51, 1945.



CENTRAL GRAPHIC REMOTE CONTROL BOARD showing entire system — along with the temperature indicating system and a periscope through which the loading of the arena can be viewed — permits one operator to start, stop, and observe equipment operation

Boxing, Basketball, and Ballots

one of the three pumps for any one of the three machines. As an additional machine is placed on the line, an additional pump is started.

The refrigeration machines are connected into a main chilled water supply header. From this header, branch piping is installed to the air conditioning systems. When the building was originally constructed, air washers were installed in the supply systems of the arena. These washers were modified and new spray systems were installed. In other areas of the building, where the dehumidifiers are above or below the level on which the arena equipment is installed, closed chilled water coils are used. The maintained pressure in the chilled water supply line circulates the water through the closed coil systems back into the refrigeration apparatus room where this is discharged into a chilled water storage tank. The return lines from the spray type washers flow by gravity into this tank.

From the chilled water tank, a main chilled water suction header connects to the three circulating pumps.

The tank is constructed of steel plate, has a capacity of 10,000 gpm, and is provided with baffles so that the water flows in a circuitous pattern through the tank to release entrained air.

As the air conditioning systems are operated only when required by scheduled events, the temperature of the chilled water system, when not in use, becomes that of the building. To provide for a quick pulldown in temperature of the chilled water system, which has a capacity of 45,000 gal, the four spray type dehumidifiers for the arena and the one for the ballroom are provided with special piping connections.

The chilled water supply line to each of these five dehumidifiers, instead of being connected directly to the spray system of each dehumidifier, is connected into the pan. A weir is installed across the width of the dehumidifier, and the chilled water then flows across the pan, over the weir, and returns by gravity to the water storage tank. A separate circulating spray pump is installed for each dehumidifier. The suction to this pump is connected into the chilled water line to the pan. The spray pump is used only when air is supplied through the dehumidifier to its conditioned space.

In the chilled water supply line before the pump suction connection, a lock shield valve is provided to balance the water flow to each dehumidifier.

A float controller in the supply line prevents the operation of the dehumidifier spray pump unless the line to the pan is full of water.

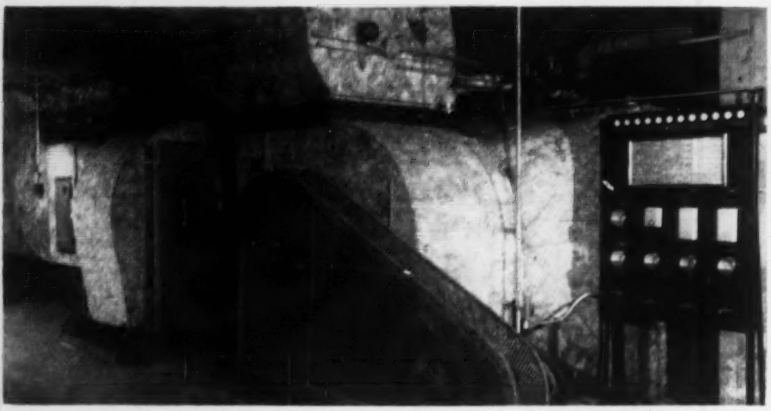
Tower in Original Enclosure

The condenser water is circulated by three centrifugal pumps circulating 4500 gpm. These pumps are connected into a main header connecting to the three refrigeration machines. This permits similar pump and machine operation as described for the chilled water system. The 18 in. condenser water lines to and from the cooling tower rise through the building on the rear stage wall to above the roof, then horizontally above the roof to the cooling tower.

The piping from the tower is under the basin connected to five sumps in the bottom of the tower basin. Each sump is provided with two removable screens in series.

The piping to the tower is provided with a separate valved connection to each of the five cells.

When Convention Hall was built,



SIX SUPPLY SYSTEMS and six return-relief systems handle 565,000 cfm of air for the arena alone. These supply systems are equipped with electrostatic filters. All other systems have cleanable, dry type filters

an enclosure 114 × 31 × 25 ft high was provided for the future tower. The sides have 16 openings, each 11 × 20 ft, through which air is admitted. The top of the enclosure has an opening 13 ft wide × 100 ft long. When constructed, this was covered with a concrete slab placed 5 ft above the enclosure roof. To provide for release of the discharge air from the five tower fans, this concrete cover was removed.

The tower constructed within the enclosure cools 4500 gpm from an entering temperature of 95 F to a leaving temperature of 85 F, based on 78 F WB. The tower is induced draft, counterflow, wood filled, 92 ft long × 23 ft wide × 16 ft high, from water basin to fan deck level. The side casings are $\frac{3}{8}$ in. cement-asbestos sheets. The framing is wood with intermediate horizontal and diagonal wood braces constructed to withstand 100 mph winds. Redwood is used throughout.

From the fan deck level, side closure pieces are installed to the underside of the enclosure roof to prevent the fan discharge air from short circuiting down into the tower intake louvers.

Reuse Existing Equipment

All equipment originally installed was inspected and tested to determine performance, and wherever possible it was reused. For some systems, only the fans and motors could remain, and all other equipment was removed. For others, dehumidifier, fan, and some auxiliaries could be reused.

The systems, in general, are provided with an outdoor air intake so that in the in-between seasons when refrigeration is not required it is possible to supply 100 percent outdoor air. Relief-return air fans return the air from the conditioned space and, depending on conditions, either discharge some of the air outdoors and some into the outdoor air-return plenum or discharge all air to outdoors.

The four systems supplying air to the top of the arena and the two for the under-balcony space are each provided with electrostatic filters. All other systems have cleanable, dry type filters in the outdoor air, bypass, and return air connections.

To provide for the fluctuating load requirements in the meeting rooms and in all of the stage dressing rooms, a hot water booster circulating system is installed. The supply ducts to these rooms are provided with hot water heaters, each being separately controlled by a thermostat in the respective rooms.

To retain the architectural decorative features wherever possible, the existing outlets were reused. Where new outlets were installed, they were placed without destroying these features. In the three large meeting rooms, due to the quantity of supplied air when these rooms are used at their maximum, perforated metal ceilings were used for air distribution.

The exhibition hall is provided with ceiling air supply outlets which consist of dropped ornamental plaster plaques, with circular openings through which air is supplied.

For many functions of the arena, the stage is used by the speaker and others of the head table. To provide comfort for those on the stage, two air conditioning units provide for a seating arrangement of 300. The units connect to horizontal ductwork.

Solve Arena Problems

When the structure was built, there were provided at the main ceiling of the arena — in four continuous locations throughout the length of the arena and at two continuous locations around the horseshoe end of the arena — dropped sections of the main ceiling to represent furred beams. On the face of these, there were installed decorative plaster supply outlets having oval shaped openings. In back of these openings there are plenum boxes with branch ducts connecting to the main arena supply duct.

In the planning stage, in order to determine the pattern and observe the air flow from these openings, smoke bombs were used. Air measurements were made simultaneously to determine the quantity of air flow. It was found that if the outlets as originally installed were used, the quantity of air for the conditioning requirements would follow the sloping part of the ceiling and, striking the walls and being deflected downward, would cause objectionable air movement throughout the balcony.

To correct this condition, additional supply outlets were installed around the perimeter of the arena directly below the juncture of the curved ceiling and the walls above the balcony level. The grilles were selected with fixed cores to deflect the air up and across the underside of the sloping ceiling. The new ducts connecting to these outlets are connected into the main trunk duct supplying the original outlets of the arena.

Through periscope, operator scans arena to determine rate of loading, then adjusts system

The four arena supply fans are driven by two-speed motors. The main trunk duct connected to the original ceiling outlets is provided with a pneumatically controlled damper. The new duct supplying the new outlets is connected into this duct on the fan side of damper. In operating the arena system at the low speed, the volume damper automatically is in the closed position with air being supplied only through the new wall outlets. When, by the loading of the arena, additional air is required and the fan is operated at high speed, the damper opens and air is supplied through the ceiling outlets. The return air fans are provided with two-speed motors and operate at the same speed as the supply fans.

For the under-balcony arena area there were originally installed ornamental cast metal supply grilles on the face of the under-balcony wall near the under-balcony ceiling. Whenever the arena was provided with display stands for various trade conventions and exhibitions, or whenever temporary bleacher seats were installed in the under-balcony area for major sporting events, these interfered with the air supply from the grilles. In the new design, from the ducts supplying these original grilles, new branch ducts are installed in the space above the under-balcony construction. And on the under-balcony ceiling, flush four-way type diffusers providing different air flow quantities through the four sides are installed.

The installation of wall outlets made it possible to condition the arena without any noticeable architectural changes.

Periscope Shows Arena Loading

The operator in the refrigeration room can visually determine the rate at which seats are being occupied in the arena by a periscope. This permits the operator to anticipate the requirements of the air conditioning system and regulate equipment accordingly. The loading of the arena occurs within a short period of time from a no load to full load requirement.

The periscope lenses are mounted in an aluminum tube. The periscope consists of three sections: a bottom horizontal section 13 ft, 6 in. long, on the end of which is mounted the eyepiece, which is adjustable for focus; a vertical section 79 ft, 6 in. long, in which are mounted achromatic extender lenses, and an upper horizontal section 8 ft, 9 in. long, at the end of which is mounted the objective lens, which is 30 ft above the floor of the arena on the right hand side of the proscenium and placed 3 in. beyond the wall line. The lens transmits an image from a 60 deg wide angle objective.

Graph System on Control Board

In the refrigeration room, an operator's panel contains a potentiometer temperature indicator and 60 selector switches. The operator, at regularly logged intervals or as required for system operation, reads the temperature of the air supplied by the air conditioning systems and the room temperatures at strategic locations within the conditioned areas.

A two point temperature strip chart recorder produces a permanent record of the dewpoint being maintained by one of the main fans serving the arena and also the temperature in the balcony at the horseshoe end of the arena.

Also in the refrigeration room there is a central graphic remote control board, 15 ft long × 4 ft high, constructed of stretcher steel and supported on channel frames. It is constructed in four sections.

The face of the board has a light green non-reflecting lacquered finish. Gray laminated phenol plastic cut-outs are cemented on the front of the panel. These cut-outs are shaped conforming to the general arrangement of the equipment of a respective system with the fan, pump, electrostatic filters, dehumidifier, heater and other parts, being indicated by lines routed in the surface of the plastic, exposing the white layer underneath. Equipment nameplates and the system identifications are similar.

Pilot lights on each piece of motorized equipment and remote control start and stop buttons permit the operator visually to determine immediately whether the system with its component units is in operation.

Pneumatic switches on the board permit the positioning of the summer and winter controls of all equipment and manual resetting of discharge temperatures for those systems supplying the arena, ballroom and the exhibition hall to enable the operator to adjust for fluctuating people loads.

Air gages indicating line pressures to the controlled equipment permit the operator to adjust the pressure in accordance with a printed schedule to maintain the desired discharge temperature.

Color coded tracer lines connect the various components of each system which have to be operated as a whole and which control the six major areas of the building. These lines consist of a section of plastic sheet, in which the colors are applied. The operator can tell at a glance that all equipment interconnected by the same line of the same color code must be in operation when that particular section of the building is being used.

The installation of the control board, temperature indicating system, and periscope, all within the room housing the refrigeration equipment, makes it possible for one operator to start, stop, and observe equipment operation.

The air conditioning contractor was the W. M. Anderson Co. ≠

BENJAMIN
The Universal

Of his many inventions, only the Franklin stove bears his name. Yet he made many contributions to the science of heating and ventilating. The 250th anniversary of his birth is being celebrated in 40 countries this month.

By Thomas Coulson
Director of Museum Research
The Franklin Institute

On June 25, 1927, at White Sulphur Springs, W. Va., Benjamin Franklin was officially proclaimed the patron saint of the American Society of Heating and Ventilating Engineers, a canonization enjoyed with engineers and men in all sorts of trades and services.

Franklin's versatility is too well known to require emphasis, but his numerous contributions to the comforts of life are prone to be overshadowed by his impressive gifts to fundamental science. His clear observations of natural principles, and his simple direct applications of them to human needs, are in no field better shown than in heating and ventilation. He was responsible for many inventions, but the only one which bears his name is the Franklin stove.

Consulted on Ventilation

But the stove was not his only contribution to the field of heating and ventilation. Before his invention of the stove he had given considerable attention to the subject of ventilation. It is sometimes said he was the first to observe that human respiration communicated a noxious property to the air. From an observation made in a cave he decided to make an experiment. This he did by placing a lighted candle in a mug into which he had been breathing gently through a tube. The flame of the candle was extinguished. It should be remembered that at this time oxygen and carbon dioxide had not been identified.

While he was in England as the agent for the Commonwealth of Pennsylvania, Franklin was consulted by the British government upon the ventilation of the House of Commons, which was notoriously defective. He "represented that the personal atmosphere surrounding the members might be carried off by making outlets in perpendicular parts of the seats, through which the air might be drawn off by ventilators, so placed as to accomplish this without admitting any by the same channels."

He also proposed, later, that openings should be cut close to the ceilings of rooms communicating with a flue which should run through the walls close to the flues of the chimneys. He particularly recommended that a flue should be constructed close to a kitchen chimney, because the constant fire there would keep the sides of the flue warmer than those of the other chimneys, whereby a more rapid current of air would be maintained.

These enlightened views upon a neglected subject were conveyed to the Messrs. Adams of the Adelphi, who applied the principles to the construction of the great meeting hall of the Society for the Encouragement of Arts.

In Advance of His Time

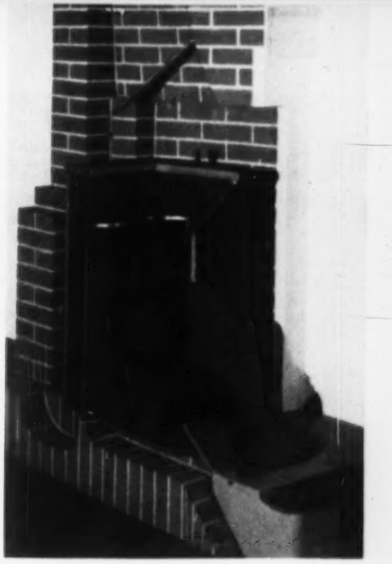
In all his views on ventilation, Franklin was far in advance of his times. He proclaimed that man's natural breathing element was the air from out of doors; that, contrary to common belief, the night air was as beneficial as that of day; that human beings poisoned the atmosphere by exhalation; and that this vitiated air could only be refreshed by drawing in air from outdoors.

His attention to ventilation questions led him to an investigation of smoky chimneys, and eventually to the invention of the Pennslyvania Fireplace. These activities spread his reputation as a scientist over the European continent as well as over the Colonies.

Before his invention, smoky chimneys were among the commonest annoyances of domestic life. A smoky house was mentioned by Shakespeare as among the most tedious things in life. This form of annoyance had attracted Franklin's attention while still a young man, for he had introduced it as a subject for discussion by the Junto, that famous club of ambitious young men he had gathered together. He commented upon the singularity "that though chimneys had been so long in use the construction should be so little understood,

FRANKLIN:

Smoke Doctor



REVOLUTION IN HEATING came when Franklin brought the fireplace out into the room and produced an economical heater. Model is shown here

till lately, that no workman pretended to make one which should always carry off all the smoke." Thirty years later, Lord Kames wrote that he had bought a house in Edinburgh that would be the most complete in the city but that the chimney smoked. He appealed to Franklin as "a universal smoke doctor" to remedy it.

Oddly enough, Franklin's essay on "The Causes and Cures of Smoky Chimneys" was written at sea, where one would have thought he was remote from the subject. However, he succeeded in making a thorough and exhaustive scientific discussion on nine direct causes of the effect, and suggested direct remedies in each case. He announced the principles on which both the annoyance and its remedy were based. The essay is written in sprightly style and contains some well told illustrations and anecdotes.

Makes First Metal Heater

One of the greatest disadvantages of the old fashioned fireplaces was the local warmth they provided. "The cold air so nips the backs and heels of those that sit before the fire, that they have no comfort till either screens or settles are provided to keep it off, which both cumber the room and darken the fireside. . . . In short it is next to impossible to warm a room with such a fireplace." Franklin took the fireplace in the wall and brought it out into the room, and produced an economical heating stove. This had the further distinction of being the first heating device to be made of metal.

A considerable number of so-called Franklin stoves are still obtainable which, upon examination, will be found lacking the essential features. There can be no doubt about the correct design of the Franklin stove, for when he suggested that his friend Robert Grace should make the stoves on a commercial basis, Franklin wrote a pamphlet to promote sales. In this he describes precisely how the stove should be constructed. Unhappily, the majority of those who later made the stove were satisfied to make a replica of its outward elements, and neglected to install the artfully arranged plates that gave the stove its special qualifications for heating a room.

The pamphlet is not unlike a modern sales manual. Franklin begins by reviewing the principles concerning heated air; proceeds with a brief description of the various fireplaces and stoves then in use; points out their disadvantages; gives a full description of his new stove and describes its advantages.

Secret Was in "Air Box"

The secret of the stove's superiority resides principally in the arrangements made to prevent the warm air, heated by the fire, from rushing directly up the chimney. To overcome this, Franklin provided an air box, composed of two plates that do not extend to the top plate of the stove. These are so arranged that the heated air rises to the top of the air-box plates and then is drawn down between them. Thus is offered a large metal surface to be heated which warms the room with a rather crudely designed form of radiant heater. As the fireplace was set out from the chimney, it more successfully warmed the whole room. And as the arrangement for drawing air into the fire to be heated was greatly improved, drafts were reduced so that those seated around the fire were no longer "schorcht before, and, as it were, froze behind."

Franklin did not overlook any detail in the construction, fitting, and use of his stove. Leaving nothing to chance in his pamphlet describing it, he included instructions to the bricklayer for building the chimney and the best way to lay a fire in the grate. He even foresaw the objections that might be raised against its adoption and answered them fully.

The science and the practice of heating and ventilating have made gigantic strides since Franklin's days. But of all the elaborate systems now in use involving the heating, moving, and humidifying of air, every one goes back to the first principles so fearlessly outlined in the face of prevailing prejudices, by Benjamin Franklin, "universal smoke doctor." ✣

Predicted for 1975 by the U. S. Chamber of Commerce — see November 1955 HPAC Editors' Pages — the air curtain is here now. The first installation in the U. S. is now operating in a Cincinnati suburban supermarket (left).

Air Curtain Seals a Door Opening

By Edward E. Gygax
Engineer,
American Air Curtain Corp.

THE METHOD of using air curtains for sealing door openings was developed in Switzerland. Extensive experimentation and testing has provided the basis for some two dozen successful installations during the past two years. The first installation in the U.S. is now in operation in a new supermarket in Dillonvale, Ohio, a suburb of Cincinnati.

How It Operates

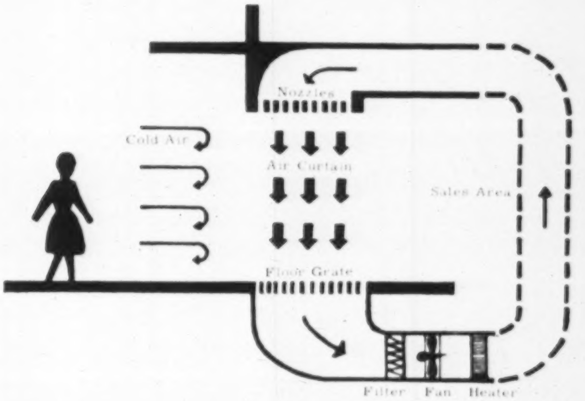
The air curtain acts as an insulating wall which can be penetrated only by solid bodies. This wall consists of a vertical downward flow of air through an opening, providing a barrier which cannot be penetrated by insects, dust, wind, or rain. Air is discharged downward through a number of nozzles from a plenum chamber at a regulated velocity and temperature. The discharge nozzles separate the air into vertical layers or curtains of air, the number depending on the application. The air velocity is constant for inside doors and variable when wind or building pressures are involved. The air nozzles are directional so that the curtain can more effectively counteract wind pressures. Design is generally based on stopping a 40 mph wind and neutralizing the building's internal or external pressure. One installation has successfully neutralized an external pressure of 1 in. WG caused by a balcony immediately inside the entrance which provided a stack effect, plus the wind pressure.

Air is returned through a floor grate and into a floor pit where dust and foreign matter are removed and washed away. Water sprays are provided to periodically flush the pit.

Special metal washable filters are used to filter the air, and blowers return the air to the plenum chamber for recirculation.

Outside entrances have a means for heating the curtain air. Steam or hot water coils and gas or oil fired or electric heaters can be used. Cooling is desirable for large installations when the building is air conditioned. Air temperatures approximately 5 F above the inside temperatures are maintained.

Either manual or automatic operation of variable air delivery and air discharge nozzle control may be used. Manual control has been found to be satisfactory in most installations. Slight adjustments may be necessary when wind pressures change, but



AIR CURTAIN acts as insulating barrier which can be penetrated only by solid bodies. Depth of nozzle field depends on external and internal pressures and is greatly influenced by exposure of opening

sales clerks have been able to provide satisfactory adjustment.

The discharge velocity at the nozzles varies, depending on the application and the height from the floor. Tests were conducted to insure designs providing maximum comfort of curtains installed in public entrances. Variable speed motor drives are used, and most of the time the blowers are driven at half speed, the speed being increased as the pressure differential on the opposite sides of the curtain increases.

Under normal conditions a gentle breeze is felt at the head level, but it will not disturb the ladies' hair, which has been found to be the most critical condition. The maximum velocity is used only when strong winds occur. At such times, the air curtain velocities are approximately half the wind velocities. On industrial applications the discharge velocity can be increased two or more times those used for comfort.

The air curtain has been used to ventilate buildings by spilling the air inward and exhausting some of the air at the opposite end. The external spillage of air keeps entrances dry and free from rain, snow, and ice.

The Dillonvale installation consists of an 11 ft door. The entrance, facing southeast and subject only to mild winds, is covered by a pylon and overhanging canopy. Night closures consist of three swinging doors. Three blowers operated by a 5 hp variable speed motor provide six curtains of air, with a total of 12,000 cfm maximum air delivery. The air is heated by a gas fired unit heater.

Design Simplifies Installation

This installation was designed as a package to simplify installation. The return air pit was poured with the foundation walls. Then two air ducts of plywood with aluminum bonded sheets and aluminum extrusions were assembled and erected at each side of the entrance. A complete air handling unit, consisting of blowers, motor, filters, and discharge nozzles, was then set on top of the two air ducts, thus forming a self-supporting unit. The packaged type unit may be used for door widths up to 15 ft and provides an economical method of installation.

For larger doors and for entrances where the air curtain can be built into the building, the air ducts can be built of masonry or furred into the walls. Equipment rooms in the basement adjacent to the pit or above the ceiling next to the plenum chamber are generally advisable. These rooms provide easy access from a maintenance standpoint. Night closures are required and may consist of doors which slide up, down, or sidewise, accordion doors, or show cases which recess into the floor during the day.

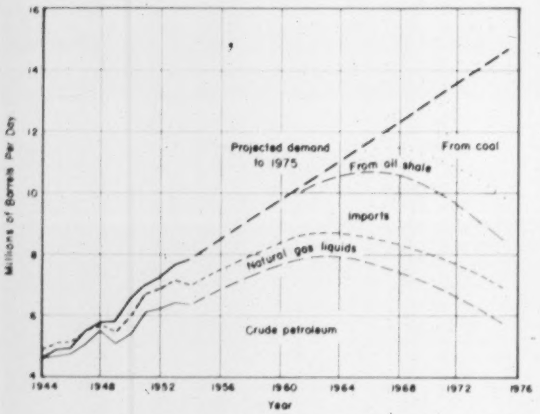
Costs About $1000 Per Ft Width

Initial cost is slightly higher than for conventional closures. The average cost for a completely installed air curtain averages approximately $1000 per ft width of opening. Being a custom designed installation, there are a great many variations which affect the cost. The exposure of the opening has the greatest influence on cost. When the opening is subject to severe winds or large external or internal pressures, a deep nozzle field is used, producing the maximum number of protective air curtains. Cost is held to a minimum by a protected entrance which reduces the depth of the nozzle field, reducing the air volume required and thus reducing the equipment size. The cost decreases somewhat as the width increases.

Maintenance is primarily related to cleaning the filters and pit which have collected dirt which did not enter the building. A weekly schedule is recommended for these operations. The balance of the equipment, the blowers, motors, and bearings would fit into the general maintenance schedules.

No Air Moves Through Opening

Some heat loss or heat gain occurs at the opening because of the heat transfer between the outer layer of the curtain and the outside atmosphere. The losses are also directly related to the amount of spillage. Because there is, in effect, no air movement through the opening, the "so-called" door usage losses are eliminated. These losses through conventional doors constitute a high percentage of building losses and are related to the traffic handled. The greater the traffic handled through an opening, the more cost justification there is for the air curtain. Operating costs are estimated at between 15 and 25 cents per hr. #



PETROLEUM DEMAND AND PRODUCTION to 1975 is projected here for the U.S. Production shown is composite of three highest forecasts in the lower Figure on page 149

Interest in synthetic fuel production became keen towards the end of World War II to meet a tremendous increase in the demand for petroleum products. Several laboratories and demonstration plants were established and plans for others were announced. After the War, however, most oil companies undertook huge expansions of refining facilities and intensified exploration and drilling efforts. As oil production and proved reserves, along with increased imports, became more than equal to the demand, the production of synthetic liquid fuels did not develop as had been expected. Under the circumstances, the production of synthetic liquid fuels would be attractive only if it could economically displace petroleum.

Many attempts were made to make realistic estimates of the cost of production of synthetic fuels, and the results in some cases varied widely. None, however, showed that synthetics cost less, and interest in the immediate production of synthetic liquid fuels declined sharply.

Natural gas, at the end of the war, was abundant enough in some localities to encourage its use as a raw material for the synthesis of liquid fuels. As new pipe lines were built, and as restrictions on the use of gas were lifted and new markets were opened, the demand for natural gas rose rapidly, and in a few years the question of satisfying an always increasing future demand began to assume major importance.

As with oil, thoughts turned to production of synthetic pipe line gas by conversion of coal. The technical problems were considered to be surmountable, but again, none of the estimates of cost of production indicated that a synthesis process would be economically feasible under present prices.

In considering the future of synthetic liquid and gaseous fuels, no new estimates of the cost of production are here submitted, nor are any new economic comparisons made between the two. Rather, examined here are the factors that will determine the production of synthetics almost without regard to present price structure. These factors are the rate of growth of energy demand, particularly for liquid and gaseous fuels, the supply and availability of natural fuels, and the logistics of the probable future circumstances.

Synthetic

By H. R. Batchelder
and
H. W. Nelson

Fuel Technology Division
Battelle Memorial Institute

THE PRODUCTION of synthetic liquid and gaseous fuels from coal will begin soon in isolated special cases, and general introduction of synthetic fuels will begin in about 10 years. In the next 10 years after that, production capacity will increase greatly, and synthetic fuels will be major factors in the U. S. energy picture by 1975.

This development of synthetic fuels in the next 25 years is seen despite the higher cost—compared with petroleum and natural gas—and despite the outlook for atomic and solar energy as supply sources.

Based on recent surveys of energy supply and forecasts of demand, these predictions are the result of an attempt to use only conservative and reasonable estimates.

The demand for energy, based on growth in population and output of goods and services, is steadily increasing. To avert a large energy deficit in 1970, this switch in our energy supply is required because of dwindling petroleum and natural gas reserves and the as yet commercially undeveloped atomic and solar energy programs. Fortunately, coal will still be abundant for making synthetic liquid and gaseous fuels.

Energy Demand Skyrockets

From 1900 to 1950 the total volume of goods and services in the U. S. increased five fold, while the labor force only a little more than doubled its size. In the same period

Fuel Production Must Begin Soon

Rapid development of synthetic liquid and gaseous fuels from coal before 1975 seen to avoid huge energy deficit

the demand for energy rose five fold. From 1950 to 1975 the gross national product is expected to double.

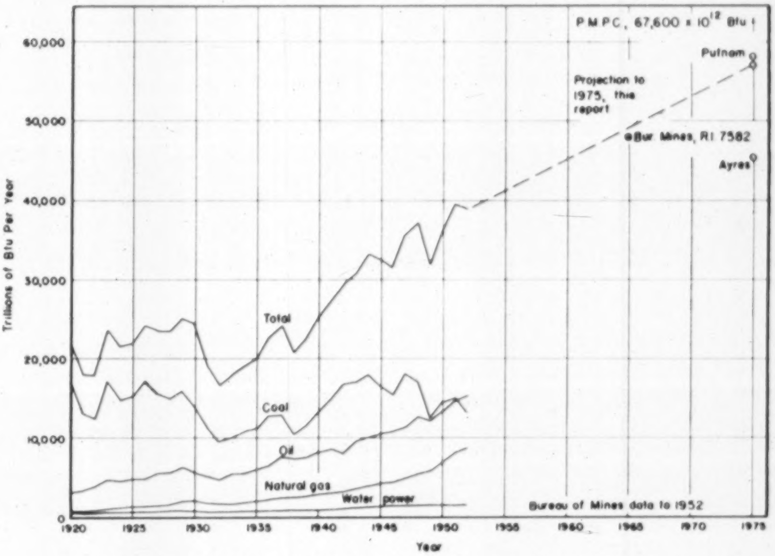
Population, 165 million in 1955, will reach 210 million in 1975, according to the latest census estimate. This is substantially higher than 1945 and 1951 estimates. The significance is that more energy than was estimated even a few years ago will be required in the future to maintain the standard of economy.

From 1920 to 1952, the average rate of increase in annual per capita energy use amounted to slightly over 1 million Btu per year. In 1952, the per capita rate was about 247 million Btu annually, whereas in 1920 the figure was 212 million. The increase in per capita use on a percentage basis was 16 percent, whereas the total energy consumption during this period increased by 77 percent. The population increased from 106 million to 157 million during those years.

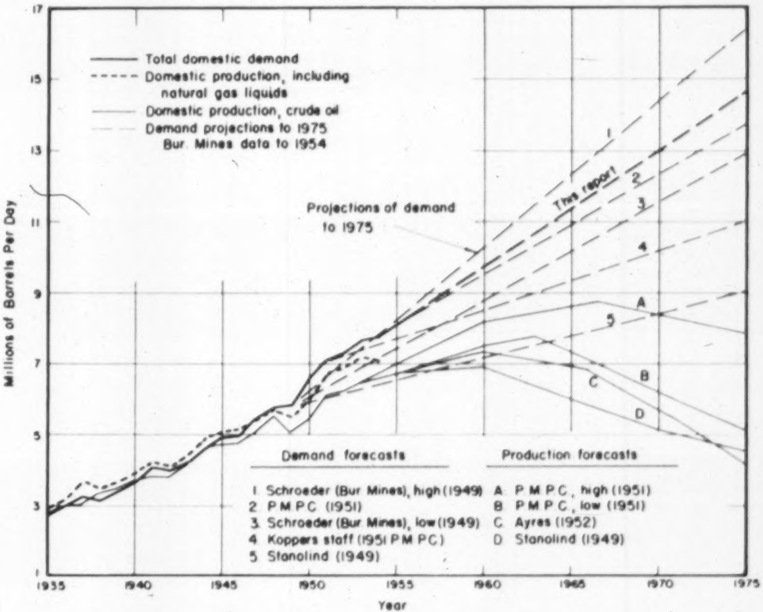
The use rate per capita since 1920 for the several mineral fuels has also shown changes. Petroleum consumption per capita increased 227 percent, natural gas 577 percent, and coal decreased 48 percent.

The total energy demand for 1975, projected from the average rate of growth per capita usage from 1920 to 1952, is 57,000 trillion Btu, an increase of 47 percent over 1952. This compares with an estimate of 67,600 trillion Btu by the President's Materials Policy Commission.

Much progress has been made in developing the application of nuclear fission to the production of electricity, and progress should be more



ANNUAL SUPPLY OF ENERGY from mineral fuels and water power in the U.S. from 1920 to 1952 has been subject to changes in use rate. Future demand is projected, showing estimates for 1975 and one for 1965



PETROLEUM DEMAND AND PRODUCTION, shown here from 1935 to 1954, has required increased imports for balance since World War II. Future demand is projected on the basis of average rate of rise of demand per capita from 1920 to 1954 and the estimated population in 1975

Abstracted from a paper presented at the recent Joint Fuels Conference of the American Society of Mechanical Engineers and the American Institute of Mining Engineers.

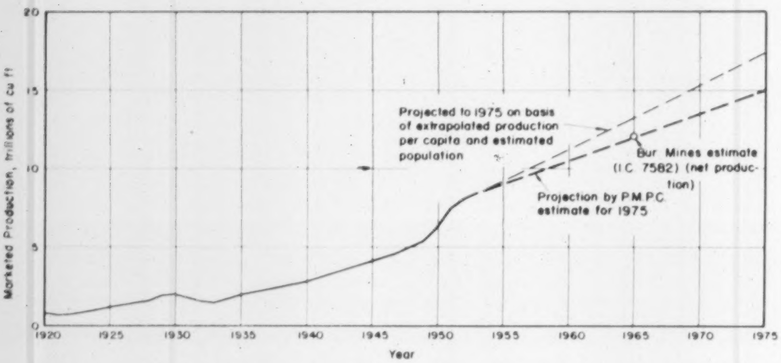
rapid in the future. It has been estimated that within 25 years one-fourth of the new power plant construction will be atomic. W. Kenneth Davis, Director of Reactor Development for the Atomic Energy Commission, in a talk before the 17th American Power Congress in 1955, gave his estimate of the probable rate of this growth: 2 million kw of capability by 1960, 5 million by 1965, 27 million by 1970, and 83 million by 1975. This will be a remarkable rate, if achieved, and it may well be.

However, 83 million kw of capability predicted for atomic power—if generating continuously—would amount to 2500 trillion Btu per year, or 4.4 percent of the estimated total demand of 57,000 trillion Btu in 1975. Actual production would probably amount to 1400 trillion Btu per year, or 2.5 percent of the total. Since this would be less than our 1952 production of water power—1600 trillion Btu—atomic power, even with a generous forecast, cannot noticeably alter the over-all energy picture within the next 25 years.

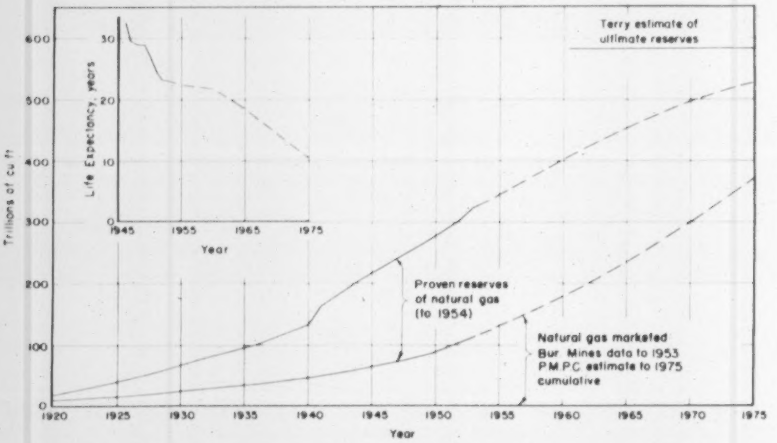
Solar Energy Minor in 1975

As for solar energy, which has frequently been spoken of as our ultimate resource, this may well be eventually developed. But our total energy demands are now at such a high level that development of any new source must proceed a long way before its contribution to the total is of real significance. Therefore, it does not seem reasonable that solar energy—even though it grows at a rapid rate—can rise to major proportions in the next 25 years.

Supply of and Demand for Liquid and Gaseous Fuels Grow



MARKETED PRODUCTION OF NATURAL GAS is expected to double from 1950 to 1975. Since gas production and use are limited by distribution capacity, a "demand" curve cannot be plotted as for other fossil fuels. Estimated possible production and use — top line — is a projection of the production curve based on the rate of growth of the per capita use from 1920 to 1953 and the population estimate for 1975



CUMULATIVE MARKETED PRODUCTION AND PROVEN RESERVES of natural gas in the U.S. from 1920 to 1953 and the projected situation to 1975 result in a life expectancy of 10 years in 1975

The background of the fluid fuel demand in the U. S. is one of gradual, continued growth. This growth has not been affected much by wars or business slumps, and the occasional dip in demand has been quickly neutralized in a subsequent year, and the upward trend continued.

Need 15 Million Bbl Liquid/Day

Up to the period shortly after World War II, production of petroleum and natural gas liquids was above the demand. Since then, however, production has lagged behind demand, and imports have made up the deficit. Production of crude, in particular, has decreased relative to the demand.

The estimated demand for liquid fuels in 1975—based on the average rate of rise of the demand per capita from 1920 to 1954 and the estimated population for 1975—is 14.6 million bbl per day. Since 1920, the annual demand for petroleum products has grown from 4.28 bbl per capita to 17.42 bbl per capita in 1954. It is estimated that this will increase to 25.5 bbl per capita in 1975.

Crude Production Peak in 1967

In striking contrast to the rising demand, crude production will reach a peak around 1965, and then gradually decline. The President's Materials Policy Committee estimates two crude oil production peaks, one in 1963 and a higher one in 1967, with a slower downturn following the latter. Ultimate petroleum reserves are estimated to be 120 billion bbl.

The production of natural gas liquids is estimated to almost double by 1975. But to meet demand in the next five years or so, increased imports will be required, reaching a peak of perhaps 2.3 million bbl per day, holding this for a while, and then declining. Significant increases above this figure do not seem reasonable when considering the ships necessary, the increasing demand for petroleum products on a world wide basis, and our national security.

Shale Oil To Ease Situation

Before the time of maximum imports, the production of oil from shale should be ready to take up some of the load of the demand deficit. Shortly thereafter, it would seem mandatory to begin the production of synthetic liquid fuels from coal, by whatever method has been shown most efficient and economical by research and development in the meantime.

Even if the ultimate reserves of petroleum in this country are found to be increased substantially, the years of peak production would be shifted only moderately, and production would be increased by a small amount dictated by conservational practices of production. The need for substantial amounts of synthetic liquid fuels would then be delayed for a few years.

Natural Gas To Double

The use of natural gas has increased gradually since 1920, with a sharp rise since 1949. Because of the concentration of the natural gas supply in the southwest area of the country, the production of gas has had to await the construction of pipe lines to deliver the gas to other areas. A "demand" curve cannot be plotted for natural gas, as for other fossil fuels, since production and use can reach only the volume indicated by the capacity of the distribution system.

Based on the rate of growth of the per capita use from 1920 to 1953 and on the population estimate for 1975, the projected marketed production of natural gas in 1975 would reach about 17.3 trillion cu ft. This projection is subject to many conflicting factors with respect to gathering, transportation, pricing, and regulatory procedures. The estimate of approximately doubled marketed production, 1950 to 1975, made in the report of the President's Materials Policy Committee is perhaps as reasonable as possible at this time.

10 Year Gas Supply in 1975

The trend in relationships—particularly for the future—between cumulative production of natural gas and proven reserves gives some idea of the possible role to be played by natural gas in the fuel system of future years. By 1953 a total volume of about 114 trillion cu ft had been marketed and consumed. Proven reserves as of 1953 totaled 211 trillion cu ft.

500 trillion cu ft of natural gas will be available in the future, based on Terry's estimates of ultimate reserves and rates of future discovery. However, DeGolyer has arrived at a volume of 400 trillion cu ft of ultimate reserves to supplement cumulative production through 1947. It is estimated, therefore, that the life expectancy of our natural gas supply will have dropped from around 30 years in 1945 to 10 years in 1975. This would indicate a reserve supply in 1975 of 10 times the annual consumption at the expended rate of use. Before that time, either the use of natural gas must be curtailed, or supplementary gas must be brought into use by synthesis from coal.

Cost and Availability Affected by Several Factors

In the foregoing, an attempt has been made to arrive at a reasonable estimate of the future rate of use and supply of liquid and gaseous fuels. Some of the present uses of these fuels are low grade and will automatically be discontinued as the prices increase. This is not expected, however, to change substantially the implications of the curves. Actually this cessation of marginal uses is a continuing one and has been occurring over the past decade. The demand or use curves show the net results after such terminations have been absorbed.

Considering first the liquid fuels, the production of synthetic oil might be 0.7 million bbl per day by 1965, 2.8 million bbl per day by 1970, and 6.1 million bbl per day by 1975. It should be emphasized that this is not predicated on a given cost of synthetic relative to the present cost of crude, or on an assumed trend of future petroleum prices. This is what will be necessary for the continued maintenance of our standard of living and economic activity if the projections of past trends into the near future are reasonable.

Oil shale is certainly an attractive source of other-than-petroleum oils, and it can be expected that this will be the source of some of the early synthetic material. The major supplies, however, lie far removed from most markets, and in the long run its effect may be local. However, assume that one-third of our synthetic oil requirement is met by retorting of shale. This leaves the oil from coal requirement rising from 0.4 million bbl per day in 1965 to 4.1 million bbl per day in 1975.

Requirements for two of the oil-from-coal processes, as estimated in a survey made by the U. S. Army Corps of Engineers in 1952, are given in Table 1. Disregarding process differences and using round numbers, it can be calculated that to meet the 1965 demand, it will have been necessary:

- To invest over 4 billion 1952 dollars.
- To use in plant construction about 2.5 million tons of steel.
- To mine about 200,000 tons of coal per day (73 million tons per year). (There would also be required a production of perhaps 25 million tons of oxygen per year.)
- To have about 80,000 employees.

This is the start of what is necessary to produce the first increment of the possible future requirement. If this is achieved, then in the ensuing 10 years to 1975 the requirements will be:

- 37 billion 1952 dollars capital investment.
- 22 million tons of steel for new plant construction.
- Coal production (additional), 1.9 million tons per day.
- About ¾ million new employees.

20 Gas Plants Seen as Only Start

For natural gas, as has been pointed out earlier, it is much more difficult to arrive at a sound estimate of future demand, and of the total ultimate reserves. The upswing in natural gas consumption since the war has resulted in large part in its increased use for space heating. In almost every case, as gas became available and restrictions were eased, new units were added to the limit allowed. It has been said that this use will drop sharply as gas prices increase. There is no evidence of this to date, and much of the new construction makes use of anything but gas almost impossible. At some point, of course, rising prices would force a change to other fuels, but this is not necessarily so at the price dictated by the cost of synthetic gas.

The possibility of changes in federal and state regulations with respect to natural gas production, transmission, and distribution, is always present, as are other political factors which could alter the situation markedly.

If, however, the demand continues to rise as projected, without intrusion of major upsetting factors, there is still another point to consider. As has been stated, the rise of gas consumption was limited by and closely followed the construction of transmission lines from the gas fields to the waiting markets. Under present economic conditions, construction of a long line for less than 300 to 500 million cu ft per day is not generally attractive. Under present regulations regarding reserves, this means that each new long line must find available gas with reserves in the amount of over 2 trillion cu ft.

Under these circumstances it is possible that long before the ratio of reserves to annual consumption has dropped to an alarming figure, it would be more economical for a new line to be predicated partly on natural gas reserves and partly on production of supplementary synthetic fuel gas.

To give some idea of the magnitude of the potential in synthetic fuel gas manufacture, assume that by 1975, 5 percent of the marketed production is synthetic. This would be about 2 billion cu ft per day, or perhaps 20 synthesis plants. These would cost about $100 million each, or a total investment of $2 billion. They would consume about 100,000 tons of coal per day. If the projections were valid—and by this time the reserves are only 10 times the annual consumption—it would seem mandatory to have already reached a much higher synthetics production.

Since coal is the most general and finally the only source of these materials, the production of coal must rise in proportion as the recovery of petroleum and natural gas drops. ‡

TABLE 1—REQUIREMENTS FOR SYNTHESIS of liquid and gaseous fuels from coal were surveyed by the U.S. Army Corps of Engineers in 1952 for two different processes. Shown here is the barrel per day breakdown

	Coal hydrogenation	Fischer-Tropsch
Steel, plant construction	6 tons	(ca. 4 tons)
Employees (production)	0.21	0.23
Coal (12,000 Btu/ton)	0.40 tons	0.53 ton
Electricity	6.8 kw	11.8 kw
Investment (1952 Dollars)	10,000-13,000	10,000-13,000

Bill Dopp, Engineer and Writer, Dies

. . . creator of "Mac" for piping stories in HPAC

WILLIAM H. DOPP, JR., a regular contributor to HPAC and former sales engineer of Crane Co., died of a heart attack on December 4, 1955 in Little Rock, Ark. He was 69.

Born in Buffalo, N. Y., Bill Dopp lived in Chicago from 1909 until he retired in December 1952. He then moved to Eureka Springs, Ark., where he enjoyed three happy years of retirement.

Mr. Dopp was employed by Crane Co. for 43 years, all of them spent in engineering work. He traveled as a sales engineer for many years, visiting every state of the U. S. and the provinces of Canada. The variety and wealth of experience gained in this work later provided the background for Martin MacVane, the character he created for the stories that have been appearing for several years in *Heating, Piping, and Air Conditioning*. His latest series was entitled "Practical Piping Problems."

Bill Dopp had many interests outside his daily work. He was active in Boy Scouts, a scoutmaster for many years, and the possessor of a 25 year service pin. For 15 years, he was president of the school board of Brookfield, Illinois. He was an authority on Indian lore and all phases of photography. He built much of his own photographic equipment, including three dimensional apparatus. He was an avid stamp collector for many years.

In his later years his principal hobby was "hobbies," and he lectured on this subject frequently, illustrating with three dimensional colored pictures. In Eureka Springs he headed the annual hobby show during the Ozark Fall Festival.

A host of friends across the country regret his passing. ‡

Photos courtesy Bank Building and Equipment Corp. of America

What's Happening in *BANKTOWN, USA?*

. . . superior air conditioning systems are one of the leading weapons in the keen competition among new banks. Higher solar and electrical loads, complex zoning conditions, and other factors demand special treatment

By William Hurd Hillyer

U. S. BANKS and other financial institutions serving the public are on a spree to provide the latest in comfort, convenience, and beauty for customers. This is the conclusion of bankers, financial editors, and bank building experts who gathered recently at the "Banktown, USA" conference in St. Louis. Crusty dignity in surroundings, as in customer relations, has been crumbling in the midcentury wave of public minded glamor and friendliness on the part of the money dealers.

Now, in 1956, as a part of this transformation, air conditioning has ceased to be merely a trend and is viewed by bank building experts as a matter of course. Out of 300 bank building and equipment contracts handled recently by the most active firm in its field, only two did not involve air conditioning. Both of these banks were in small towns. The president of one had a deep seated aversion to air conditioning and subbornly refused to install it "for personal reasons." But within six months after his building was complete, he had so many complaints that he was forced to install a modern air conditioning system. The one remaining holdout may have capitulated by the time this is printed.

While methods of heating and air conditioning financial institutions are basically the same as in other buildings, there is one difference. At present, banks are demanding superior systems, with automatic controls, electrostatic filters in some cases, and efficient air distribution free from drafts and noise. Generally speaking, banks today have so complex an operating organism, with so varied a human factor, that they are outstanding in their temperature needs.

Design Year 'Round Systems for Most Banks

Such complexity calls for special treatment. Fortunately for banks, one of the greatest single advances in the industry has been the development of multizone air handling systems.

Most banks nowadays, according to specializing architects and engineers, are designed for year 'round air conditioning. The typical system cools in summer, heats in winter, and ventilates in the off seasons. Perimeter heating

THE CENTRAL TRUST CO

TWO-STORY DESIGN, with drive-up windows below and conventional arrangements on main floor above (see photo on opposite page), complicated heating, cooling problems

CHEYENNE FEDERAL has a 20 ton air conditioning system. For winter, heat obtained from district steam is distributed via warm air, convector, and baseboard systems

TWENTY DRIVE-UP WINDOWS serve the public afoot and awheel at the Manchester Bank, St. Louis. Unusual building shapes, big glass areas are typical of modern banks

to keep the chill off the walls is used extensively in combination with overhead air distribution. Increasingly, controls are being used to achieve automatic changeovers.

"Modern" and "contemporary" bank building design has forced — and been permitted by — year 'round air conditioning. Lobbies and officers' areas of modern banks almost invariably look out on the world through vast expanses of glass, while the opposite walls have no windows at all. Obviously, natural ventilation is here impossible, for few new structures have workable sash.

"For one thing," says B. C. Compton, chief mechanical engineer of the Bank Building and Equipment Corp. of America, "sash does not lend itself to modern design, and for another, few people want outside air blowing freely into the bank, unfiltered, and in many cases causing drafts that are uncomfortable to people and disastrous to papers on desks. Naturally, the great difference in the sun factor presents a temperature problem that only the most approved heating and air conditioning installation can solve."

What's Behind Banking's Transformation?

Other factors in banking's transformation are higher lighting levels, tighter spacing of employees for greater operating efficiency, and greater electrical load and heat generated by modern banking equipment.

Ten years ago the required lighting level in banks was about 30 footcandles. This is now 50, and in some cases 100 footcandles. Though fluorescent fixtures — characterized by higher efficiency and less heat per unit of light — have been used extensively, incandescent lighting, with its greater heat output, is more flexible and is more widely used.

As to the impact of automation on bank temperatures, Mr. Compton is specific. He says: "Bookkeeping and associated machines are getting larger and dissipate more heat. One job completed recently requires an air conditioning unit just to offset the heat dissipated by two bookkeeping machines. A recently developed electronic bookkeeper which serves 32,000 checking accounts uses 80,000 watts of electricity. The heat given off by such a machine is indeed considerable. Electric typewriters, television intercommunication, receivers for signature verifications, adding machines, and a host of other electrically driven devices are rapidly replacing both manual and mechanical equipment. Air conditioning requirements are being stepped up accordingly."

What of the future? Looking 15, or even 10 years ahead, experts in heating and air conditioning, as applied to banking activities, envision many advances:

- Fuller application of high velocity distribution.
- Wider use of electronic controls.
- Electrostatic filters.
- Inside water towers that do not have to be drained in winter.
- Smaller and more efficient compressors.
- Use of atomic energy for heating and cooling.

MAIN BANKING FLOOR of Cincinnati's Central Trust Co. Evendale branch is served by two self-contained package units and hot water radiant baseboard heating

. . . new bank structures present new problems

New type structures for financial institutions present new heating and air conditioning problems. At the recent "Banktown, USA" conference in St. Louis, the writer interviewed B. C. Compton, chief mechanical engineer of the Bank Building and Equipment Corp. of America, who stated some of the problems and cited five recent case histories which show how they are being solved.

In general, the architectural designs of contemporary banks feature large exterior glass areas, low ceilings with decorative lighting patterns and acoustical treatment, and unusual building shapes. Ceiling outlet design and location must suit the motif and design of the interior and, at the same time, maintain a good air distribution pattern. Hot water panels and baseboard radiation provide controlled heating of critical areas. Since space available for heating and air conditioning equipment is always limited, there is a definite trend toward compact, package type equipment in bank installations. Also, precaution is taken to reduce noise from operating equipment. Finally, bankers today are insisting on completely automatic heating and air conditioning systems which require a minimum of maintenance.

1 Fins Reduce Sun Load on Missouri Structure

The American Investment Co.'s new building (photo, page 153) in Clayton, Mo., is of reinforced concrete, finished with a gleaming white vinyl spray. Striking in design, it has functional fins on the east and west ends to shade the glass during the hours when solar gain is at a maximum. The building is air conditioned year 'round.

Because of extreme glass exposures on the south and north, private offices along these sides are on the perimeter zone, which is supplied by a high-velocity induction system. Interior zones, determined on an occupancy basis, are served by two multizone air handling units.

Space for ductwork above furred ceilings was at a premium. To keep this ductwork small, the interior zones were designed for air distribution at a semi-high velocity, up to 2000 fpm in main ducts and down to 1000 to 1400 fpm in branch ducts. Noise levels are not considered to be objectionable.

Metal pan acoustical ceilings are used extensively. In such areas, air is admitted through special perforated ceiling panels. The furred space above the ceilings is used as a return air plenum, with intakes provided by raising the acoustic insulation batts in certain of the pans. This combination perforated-panel supply and return system provides the desired air circulation.

Chilled water is furnished by a 200 hp compressor-chiller. Heat is supplied by two combination boiler-burner units, each sized to carry about two-thirds of the building heat loss at design temperatures.

2 Two Package Units Condition Cincinnati Bank

Heating and air conditioning problems of the Evendale drive-up branch of the Central Trust Co., Cincinnati, were complicated by its two-story design. This suburban building has four drive-up teller windows and one walk-up window on the lower level, with conventional banking services on the upper or main floor level. Each drive-up unit is equipped with its own exhaust fan to provide safety for tellers if exhaust fumes penetrate the units.

On the main floor, the east and west exposures are practically all of heat absorbing glass. A ceiling-high partition of wood and glass runs north and south, dividing the main floor into one-fourth on the east side and three-fourths on the west.

Because of the morning sun load on the east side and the afternoon sun load on the west — as well as from the standpoint of expense — two self-contained air conditioning units were installed. One serves the east side of main floor and the drive-up teller windows below. The other unit serves the west side of the main floor only.

Hot water heating coils with three-way valves are installed in each air conditioning unit to handle the bulk of the heating load. In addition, to offset heat loss through glass, baseboard radiation is installed under glass areas and in the drive-up teller units. Piping for the hot water heating system is installed in the insulated furred space between the main floor and the drive-up units. This made it unnecessary to install any piping under the concrete driveway areas.

Hot water coils are controlled by thermostats in the working spaces, and the baseboard radiation is controlled by an outdoor sensing element. As the outdoor temperature goes down, the temperature of the water to baseboard radiation is increased, and vice-versa.

3 Central, Package Systems Serve Florida Bank

A fine example of air conditioning in the south, and of the problems encountered there, is the new Coral Gables Federal Savings and Loan Association, in Florida. This building is three stories high and is being erected in two stages to permit the bank to continue operations in its present quarters until the first stage is ready for occupancy. At that time, the existing building will be razed and the new building completed.

Banking facilities will occupy the first floor, mezzanine, and part of the second floor. The remainder of the second floor will house the cafeteria and employee recreation room and leave space for rental. All of the third floor is rental area.

Design conditions, dry bulb, are summer 91 F, and winter 35 F. Private offices and conference rooms are on the first floor. The ceiling, with various levels, is of a dropped luminous-acoustic type over the tellers' area. The lighting design of the lobby and officers' area is incandescent, with a resulting high wattage level, which adds considerably to the air conditioning problem.

Structural conditions prevent a full basement. However, a part basement houses the equipment for the banking quarters. A five zone air handling unit serves the first floor, and air is returned through an underfloor duct. Separate zoned type air handling units take care of the upper floors. One 100 ton condensing unit provides for the banking quarters only. The rental areas are served by separate units. This arrangement is economically sound, as working hours in banks and office buildings differ. Electric heating units are installed in front of the perimeter air diffusers for spot heating, which is required for short periods of time in winter.

During in-between seasons, the first floor and mezzanine are served by a system which provides 100 percent outside air and a mechanical exhaust system operated by indoor-outdoor temperature controls. Separate thermostats regulate the electric heaters. Each zone has its own controller, which permits the system to operate until all zones are satisfied.

4 Low Velocity Panel Diffusers Serve Tenants

A new two-story building houses the Ellwood City, Pa., Federal Savings and Loan Association. The first floor and basement are occupied by the association and the second floor is rental area. Air conditioning is achieved by means of a multizone air handling unit and a compressor with an evaporative condenser.

Second floor air distribution is obtained through a metal pan ventilating ceiling, a method which has been found successful in areas subject to rearrangement of partitions.

A hot water boiler supplies heating water to coils in the air handling unit and to perimeter radiation. The water temperature in the perimeter radiation is reset by changes in the outdoor temperature.

5 Program Clock Provides Automatic Control

The one-story and basement building of the Cheyenne, Wyo., Federal Savings and Loan Association was completed in May 1955. On the first floor is the public lobby, tellers' area, drive-up teller window, work space and private offices. In the basement are the employees' recreation room, civic room, directors' room, mechanical equipment room, and storage area.

A multizone air handling unit supplies conditioned air to unrelated areas, such as the public lobby, civic room, and private offices. Refrigeration for cooling is obtained from a 20 ton condensing unit.

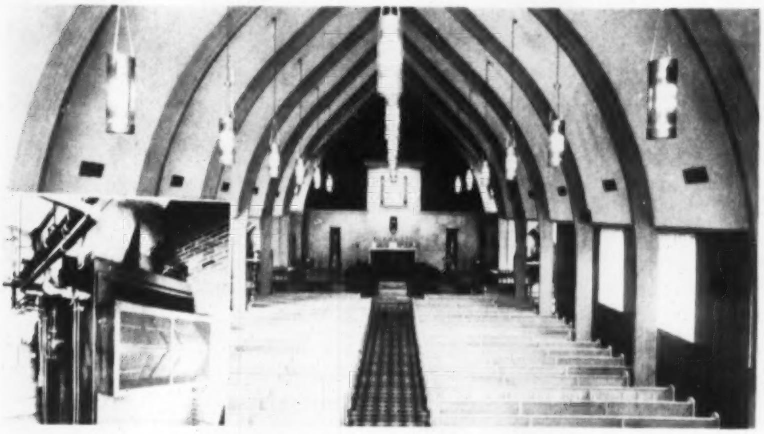
Although outside design conditions in this region are light — 95 F dry bulb, 65 F wet bulb — the inside operating temperatures have been found very low. The average inside temperature selected by the occupants of this building for the summer of 1955 was 74 F.

An economizer type of temperature control permits heating or cooling with outside air when the outdoor temperature ranges between 60 and 80 F. A program clock is used to give complete automatic control of the air conditioning and heating system.

Heat is obtained from district steam. The warm air heating system — using the same duct system as for cooling, with fan-coil units — is supplemented with convector and baseboard radiation. These units are controlled by individual thermostats in each area. Emphasis is placed on heating the large exterior glass areas, vestibules, and drive-up teller windows in this modern building. ≠

On the Job —notes from the field

Package Central System Conditions New Church



BRIGHT, SERENE NEW CHURCH has 43 tons of air conditioning to cool, filter, and dehumidify air in main church and subsidiary rooms. Hidden duct system does not mar architecture

Two 20 ton package units and one 3 ton unit air condition the beautiful new St. Raphael Catholic church in Bay Village, Ohio, according to the Typhoon Air Conditioning Co., Inc.

The two 20 tons units, installed back-to-back in the utility room just behind the altar, serve as a thermostatically controlled central system to cool the body of the church. Each 20 ton unit supplies a main duct running toward the rear of the church above the windows on either side of the seating area, with diffusers at regular intervals. At the rear, the ducts turn upward to supply a number of smaller rooms and end there.

The 3 ton unit, in a small room off the vestibule, cools the vestibule through a short duct which ends in a perforated ceiling diffuser. Primarily, this unit serves to guard the vestibule against loss of cooling.

All three units are equipped with heating coils, supplied with hot water by a basement boiler and circulating pumps. Heating is electronically regulated by outdoor anticipation temperature controls, which reset the boiler water temperature in accordance with outside temperature trends.

Return ducts for summer air conditioning, situated under the floor and leading from the rear of the church forward to the utility room, double as pipe shafts for the heating systems. In addition to this central heating system, supplementary heat is provided at all entrances by hot water unit heaters and convectors to guard against heat loss.

An unusual feature of the installation are the marble sills designed and made especially for the church's high gothic windows, in order to prevent the cold air which spills off the windows in wintertime from reaching the breathing zone and interfering with proper heating. These special sills, about 12 in. wide, have continuous slot type intake grilles which run across the entire width of each window. In winter, cold air spilling from the windows is gathered into these grilles, and channeled off through wall chases leading from each grille down into the return air ducts under the floor. ‡

Plastic Piping Cuts Plant Maintenance

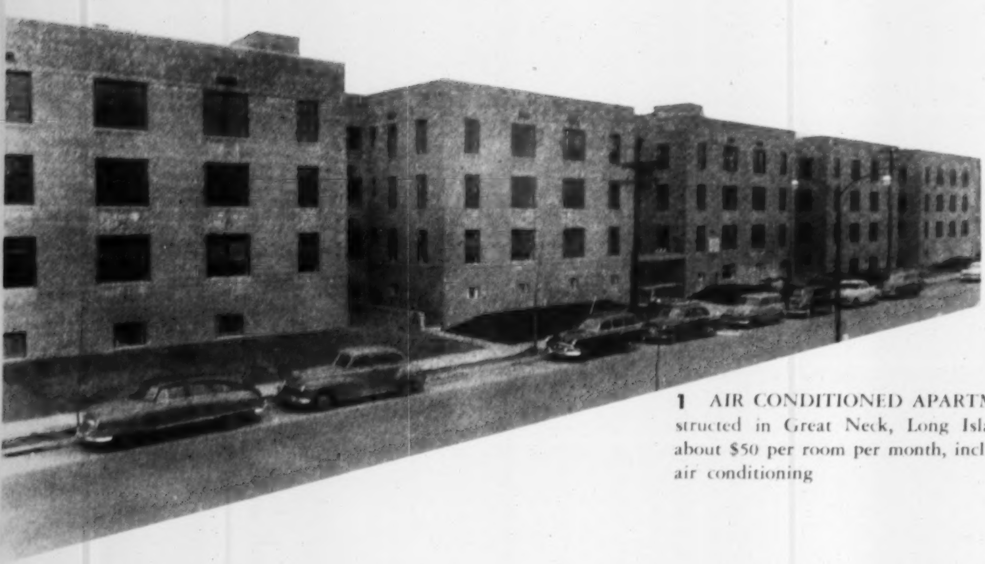
ALL threaded process piping at the J. H. Erbrich Products Co., Indianapolis, has been changed from metal to polyvinyl chloride plastic, according to Tube Turns Plastics, Inc. Erbrich, which produces vinegar, mustard, bleaches, liquid fertilizer, and other products, uses the PVC piping at atmospheric temperatures and at pressures from 50 to 100 psi.

Pipe diameters range from $\frac{3}{4}$ in. to 2 in. The piping is fabricated with PVC injection molded fittings.

"PVC piping has drastically cut piping costs, product loss, and downtime as a result of its resistance to corrosion," says A. J. Kreuger, secretary-treasurer of the Erbrich Co. Some of the plastic piping has been installed as long as one year, and some as long as two years. It has remained "fully serviceable," and "none of it is expected to be replaced in the foreseeable future." ‡

PVC PIPING transfers vinegar at the J. H. Erbrich Products Co. Other PVC lines carry corrosive fertilizer, mustard, and bleach

Remote Unit Central System

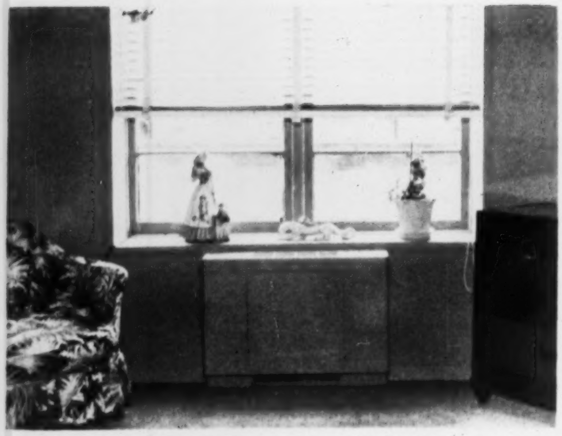


1 AIR CONDITIONED APARTMENTS, recently constructed in Great Neck, Long Island, N. Y., rent for about $50 per room per month, including all utilities and air conditioning

An electronically controlled heating and air conditioning system, comprising two zones, is featured in a new 52 apartment, rambling, three-story dwelling on Long Island, N. Y.

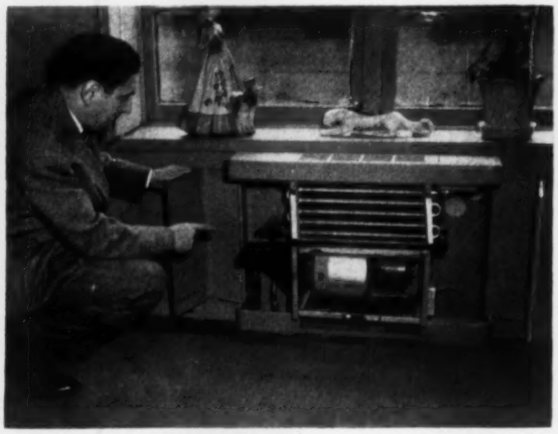
Centrally located, the hot water boiler and the water chiller supply 146 individually controlled room unit air conditioners, which heat, cool, ventilate, dehumidify, clean, and circulate room air and outdoor air. Convectors connected to the same lines that serve the air conditioning units provide supplementary heating for halls, bathrooms, and kitchens.

All piping and wiring are concealed.



Photos courtesy Modine Manufacturing Co.

2 ROOM UNITS—146 in all—are installed in all bedrooms, living rooms, and dining rooms, and provide hot water heating and chilled water cooling



3 BASIC COMPONENTS of the individual units, the author points out, are a heat transfer coil, motor, blowers, filter, and provision for condensate drainage

Heats, Cools Luxury Apartments

. . . combining functions of separate radiation and self-contained window air conditioners on a two-pipe hot water system

By Nathan Feder
Consulting Engineer

APARTMENT HOUSE HEATING has undergone continual improvement during the past 50 years, paralleling the development of new techniques and heating equipment. Tenant comfort and operating and maintenance economy have been both the objectives and the results of this evolution.

With growing emphasis on air conditioning as a requirement for full and profitable occupancy, architects and engineers have given special attention to room units which are served by a central boiler for heating and a central chiller for cooling.

Combining the functions of separate radiation and self-contained window air conditioners, the remote unit central system offers many advantages to both the building owner and the apartment occupant. Primary control of the heating-cooling system remains in the hands of the building engineer. Yet tenants are able to control the temperatures of their rooms individually, to suit their personal requirements.

A good example of this new system has been installed in The Preston House, a three-story "luxury apartment," at Great Neck, Long Island. Air conditioned throughout its rambling 200 ft length and 60 ft width, the structure includes 52 apartments of 1½, 2½, and 3½ rooms. Rentals approximately $50 per room, per month, include all utilities and air conditioning.

Use Same Supply, Return Lines

The multi-dwelling building will be kept comfortably cool in summer and warm in winter by 146 air conditioning units installed in all bedrooms, living rooms, and dining rooms. These units provide hot water heating and chilled water cooling from a centrally located boiler and water chiller. The same supply and return lines serve for both functions.

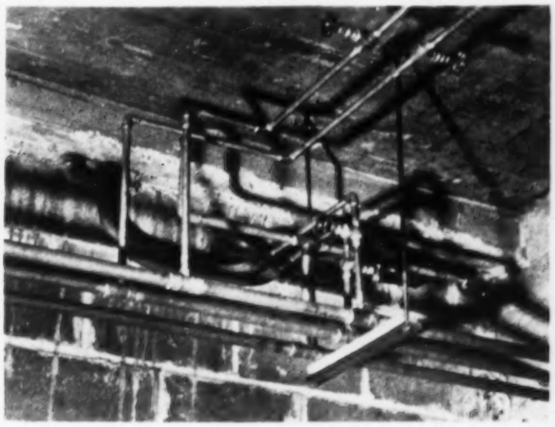
Supplementary heating for bathrooms, kitchens and hallways is supplied by 135 convectors. The convectors are connected to the same lines that serve the air conditioning units. Shutoff valves permit the convectors to be deactivated during periods when only cooling is desired.

How Units Operate

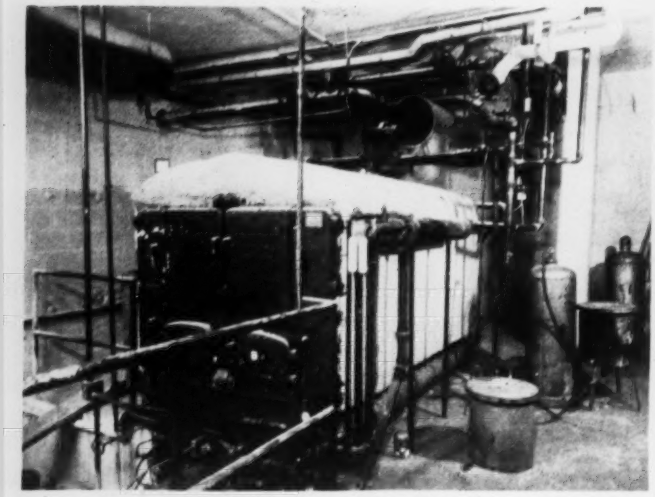
The heating design is a two-pipe hot water system with the heating and cooling units installed along outside walls wherever possible. These units heat, cool, ventilate, dehumidify, clean, and circulate room air and outdoor air. Basic components of the unit are a heat transfer coil, motor, blowers, filter, and provision for condensate drainage.

Fans draw room air into the unit through the filter, pass it over the heat transfer coil, where it is cooled and dehumidified, or heated, and

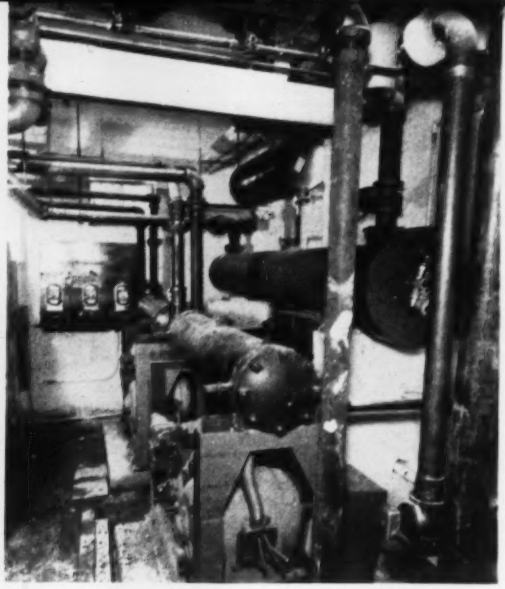
4 MINIMUM PIPE SPACE favored installing the supply, return, and condensate drain lines between stud spaces in outside walls



5 TAKE-OFF BRANCHES from supply, return, and drain mains in basement are provided for separate risers serving each row of units



6 CENTRAL HOT WATER BOILER serves not only the two-zone, 146 remote air conditioning units but also 135 convectors in bathrooms, kitchens, and halls



7 COOLING EQUIPMENT in the basement machine room includes two 50 ton compressors, a two-circuit water chiller, an expansion tank, and two circulating pumps

then is discharged into the room.

Outdoor air is introduced through vent bricks installed in the outside walls behind each unit and directly opposite an opening in the air conditioner. Adjustment of a damper controls the mixture of outdoor and recirculated air. If neither cooling nor heating is desired, room air may be circulated by merely operating the blowers.

Each air conditioning unit features individual room control and is controlled manually by a four-speed selector switch. Operational noises are kept to a minimum by resiliently mounted fractional horsepower motors and extensive use of sound-deadening mastic and glass fiber insulation.

The air conditioning units include generous space for making piping and electrical connections, and all piping and wiring are completely concealed within the enclosure. The installation includes 137 2/3 ton models that are 34 in. long and nine $1\frac{1}{2}$ ton units, 48 in. long. All of the units are 25 in. high. The 2/3 ton units deliver 440 cfm; the $1\frac{1}{2}$ ton units, 640 cfm at top speed.

System Meets these Standards

The system provides the following:

1) Cooling and dehumidifying of the individual spaces when needed.

2) Ventilation of the individual spaces at all times.

3) Air cleaning.

4) Freedom from noise.

5) Simplicity, compactness and economy of design to keep first cost low, and to keep the need for maintenance and replacement of parts at a minimum.

Design North and South Zones

All four sides of the structure are exposed, with the long sides facing north and south. We decided on a two-zone system design, based on ASHAE standards. One zone will serve the north and one the south segments of the building. Although the roof is insulated, the sidewalls are not. There are no storm windows.

Equipment Compactly Installed

The machine room is midway in the basement under one apartment and adjacent to basement apartments which are air conditioned. To overcome noise from machinery operations, the compressors are securely fastened to heavy concrete foundations. Rigid supports are used for all piping. The ceiling directly above the boiler room is constructed with an air space enclosed by a layer of sound absorbing insulation and a finished ceiling of special acoustical plaster.

Lack of pipe space — always a factor to consider — is overcome by putting the supply, return, and condensate drain lines to each floor between the stud space in each outside wall.

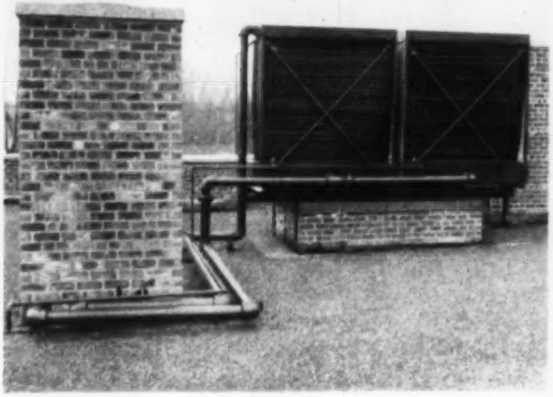
Copper tubing is used throughout, in main supply and return lines and in feeder lines, both to the air conditioning units and to the convectors.

Piping Mock-up Sets Procedure

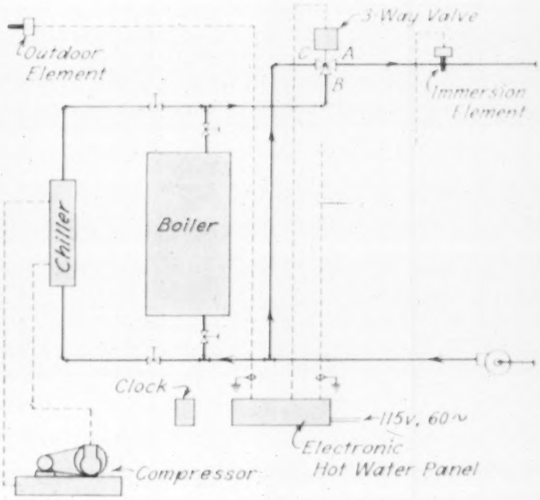
Piping procedure was determined from a piping mock-up on one unit. There are separate risers for each row of units.

Sponge rubber insulation is used on the vertical piping, and double-thick wool felt is wrapped on the horizontal lines as a protection against condensation and to minimize heat loss and gain.

Sponge rubber, a relatively new addition to insulating procedures, is particularly suited for use on vertical pipes because of ease in handling.



8 TWO 50 TON COOLING TOWERS on the roof are mounted on a special base to support the weight of the towers. They furnish condenser water, which is circulated by a 300 gpm pump



9 AUTOMATIC HEATING-COOLING is provided by the electronic hot water control panel, which provides a fully adjustable reset hot water control system in the winter and reset chilled water temperatures for summer

How Cooling Cycle Works

The cooling cycle consists of two 50 ton condensing units anchored to two concrete foundations. The units feed refrigerant to a two-circuit chiller mounted on concrete pads in the machine room. Two circulating pumps, also mounted in the machine room, circulate the water through the chiller and into the supply and return mains.

A three-way valve maintains the required temperature in the mains. An expansion tank is mounted at the ceiling of the machine room, and a connection is made from the return line to this tank.

Boiler Firing Is Constant

The cast iron sectional hot water boiler has a capacity of 10,000 sq ft EDR and is fired by a No. 6 oil burner. Because of the 30 psi pressure limit on this type of boiler, the flow of water from the header is to the suction side of the circulating pump. Thus, the boiler does not have to withstand the pressure required to overcome the friction head of the main supply and branch piping. The boiler also supplies domestic hot water by means of an instantaneous external coil mounted adjacent to the boiler.

A second expansion tank is also mounted at the boiler room ceiling and connected to the supply header because, during the cooling cycle, the boiler is isolated from the rest of the piping. The boiler is fired constantly because of the domestic hot water demand, and the protection of the expansion tank is needed.

Cooling Towers Are on Roof

Condenser water furnished by means of two 50 ton cooling towers mounted on the roof of the building. A special supporting base was installed to carry the weight of the the towers. A 300 gpm pump is installed in the machine room to circulate the condenser water.

One Panel Controls Both Cycles

The electronic hot water control panel provides a fully adjustable reset hot water control system in the winter, with the advantage of automatic night depression and morning warmup, without the use of an indoor thermostat.

With the same control panel, and with the addition of a simple summer-winter switch, the system provides reset chilled water temperatures for summer operation.

In both summer and winter, the supply water temperature is raised as the outdoor temperature falls.

Reset Valve for Changeover

The changeover for each season is made by repositioning the manual valves to supply either heated or chilled water to the automatic mixing valve. By means of the adjustable ratio and temperature setting on the control panel, the required temperatures for each season are obtained.

A typical winter setting might be 100 F supply water at 50 F outside temperature, reset proportionately to 200 F supply water at zero F outside temperature.

A typical summer setting might be 60 F supply water at 80 F outside temperature, reset to 45 F supply water at 95 F outside temperature. Both the amount of reset and the base temperature are adjustable to make a completely flexible year 'round system.

At full load in summer, there is dehumidification, but no humidification is provided in winter.

The cost of the heating and air conditioning installation, exclusive of wiring, was about $1000 per ton.

The mechanical contractor was Freezaire Corp. ‡

Sam Lewis' Page

Provide Good Drainage, Pure Fill for Best Efficiency of Conduit Insulation

. . . The insulation of an underground steam line was damaged by a bulldozer during back filling. Ground water soaked the insulation, destroying its value, and steam and hot water "boiled up" out of the ground. Who was responsible?

THERE is an outlying manufacturing plant comprising several buildings with a central boiler plant that supplies steam through an underground pipe line many hundreds of feet long. Before construction, the architects and owner stipulated that the division of responsibility should be as follows:

1) General Contractor: back-fills trenches, paves parking lot, landscapes the campus.

2) Heating Contractor: digs trench, furnishes insulated pipe conduits from the boiler plant to the buildings. (This pipe line underlies the parking lot and the flower beds.)

3) Owner: wishes attractive landscaping, with terraces, flowers, and shrubbery around the various buildings.

4) Providence: refuses to accept responsibility, but controls the ground water level, determines the floods in the adjacent brook, and regulates the intensity of thunderstorms.

The buildings were built and the pipe line was installed and the back-fill was made and the parking lot was paved. The investment in pipe and conduit approached $70,000.

The steam was turned on and steam and hot water boiled up through the paving and the ground at several places. The general contractor had back-filled the trench, using a small gasoline driven bulldozer. He had pushed back the excavated material, which contained some pieces of stone, broken brick, cinders, and other debris from former occupancy and had wetted the material down, prior to applying the paving and terraces.

The heating contractor had installed the conduits as specified. Each one comprised a steel pipe, surrounded by a thick coating of excellent quality insulation, covered with a sheet metal jacket and an asphalt-like coating. At each end of each section of the composite conduit, the steam pipe was welded to the adjacent section and then insulation was packed around the pipe, and the metal jacket was applied to protect the insulation. The joints in the jacket were crimped and a mastic, waterproof compound was smeared on to seal the joint.

The owner notified the heating contractor that he must stop the leaks, even though to do so he must cut the paving, dig down to the conduit, all at his own expense, to correct his allegedly careless workmanship.

Providence, in the interim, not being complacent, had poured plenty of rain from the clouds and had caused the brook to overflow and had raised the ground water table far above the level of the conduit. The heating contractor, on digging down to the conduit, found it submerged in water. He also found a place where the general contractor's bulldozer blade, when back-filling, had cut through the steel jacket of the conduit, through the insulation under the jacket and had reached clear to the welded pipe but had not cut the pipe. The jacket, presumably watertight, once cut, had accepted the ground water dispensed by Providence. The insulation, having been thoroughly water soaked, no longer insulated!

The heating contractor pumped the water from the trench for several days but ground water continued to appear. He turned high-pressure steam into the pipes and could find no direct blow-out of steam through the pipes, but found plenty of steam forced out through the jacket as a result of boiling the water within the jacket. He failed to dry out the insulation by this procedure, due to the long stretches between his dug-out spots, the only spots where the steam could escape. He could see no way to prevent Providence from continuing to pour cold water around the conduit in the trench.

The general contractor said that *he* didn't cut the jacket on the conduit, that his responsibility was to fill the trench and that he had filled it faithfully and well. The heating contractor

SAMUEL R. LEWIS, consulting mechanical engineer and a member of HPAC's board of consulting and contributing editors, comments informally each month on practical heating, piping and air conditioning problems.

apparently will not be paid or released by the owner unless he digs the whole thing up, replaces the insulation and the jacket, and then restores the paving and terraces and flower beds.

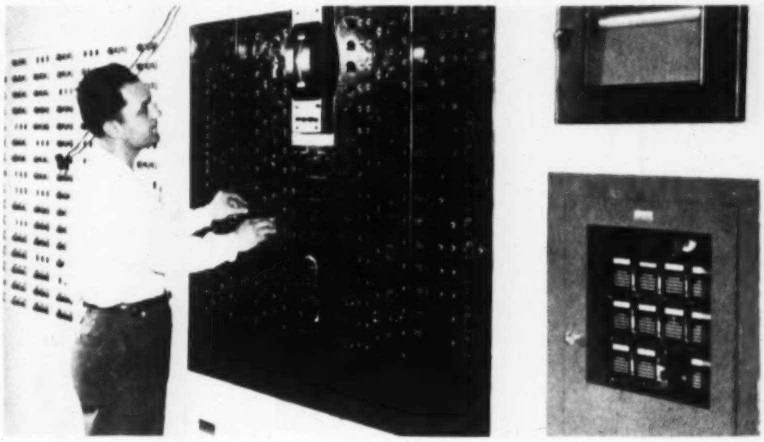
There seems to be a lesson for engineers and contractors here. If I were to design such a steam distribution system using underground conduit, I should go after the drainage first. In this case, I would have installed a drain pipe under the conduit in the trench, the drain leading to a pump that automatically would keep the ground water level down. I would make the contractor who furnishes the conduit dig the trench for it, do the back-filling, and be responsible for the quality and pitch of the drain. The conduit jacket can hardly be expected, it seems to me, to remain watertight forever, especially if the earth and debris around it are not pure. Concerning cinders and ash, I would see that there should be a watertight layer of corrosion-resistant material, such as stone and asphalt, around the conduit. ‡

Electronic Control Serves Prudential Building

. . . single remote control "brain center" panel reads, adjusts temperatures

THE "NERVE CENTER" of the Prudential Insurance Co. of America's new $40 million Chicago lakefront skyscraper is a dial studded master panel that permits the building engineer to monitor and supervise the year 'round air conditioning system for the entire 41 story structure.

One hundred eighty electronic thermostats strategically located throughout the building are linked to the panel, according to the Minneapolis-Honeywell Regulator Co. Supplementing these are more than 1200 pneumatic and electric thermostats. All are integrated into a network of more than 20 miles of copper tubing and nearly 30 miles of electrical wiring.



ELECTRONIC AUTOMATION, via this third basement master panel and a vast network of electronic-pneumatic-electric control equipment, permits engineer to check, adjust temperatures on skyscraper's 41 floors from this one point

The system was engineered specifically to meet the peculiar problems of the massive building on the windswept lakefront. Parts of the building are shaded and exposed to cooling winds off the lake, while others receive supplementary heat from the sun.

The master control panel is patterned after giant control centers which are the "brains" of modern chemical, refining, and other automatic processing industries. It automatically adjusts for the different heating or cooling needs posed by outdoor conditions. It compensates, too, for changes in temperature that occur in the morning when the building suddenly fills with thousands of people arriving for work and in the evening when they leave. It also adjusts automatically for the heat produced by lights, office machinery, and large numbers of people in conference rooms, auditoriums, and central working spaces. Yet, the master panel gives the building engineer supervision over all of the automatic processes. By the flick of a switch, he can shift the building's huge air conditioning plant from day to night operation or to either a summer or winter schedule.

One dial on the panel controls snow melting equipment in sidewalks at the two main entrances.

The electronic system is designed so that it can be supplemented later, if desired, with such new electronic developments as wind direction indicators, wind velocity indicators, sun intensity meters, and electronic "people counters."

Another future possibility is an electronic scanning monitor that would automatically check thermostats throughout the building every 5 minutes or so and type out a message to the engineer at the control panel if anything needs changing. At present, the engineer checks the temperature sensing points by pushing buttons on the control panel.

The heating-cooling equipment provides filtered and humidity-controlled air to each floor through conventional air ducts hidden in the ceiling. Private offices around the perimeter of the building have thermostatically controlled heating-cooling units under window sills. A high velocity air distribution system serves these window units. ‡

HOW TO PLAN AHEAD FOR

• How long does it take to get a new air conditioning system installed and operating? This quick review of the time-taking steps shows the wisdom of getting started well in advance

Planning and installing air conditioning, for a new or existing building, takes time and involves many steps. The decision to go ahead with the project should be made months—in some cases years—ahead of the completion date. The sequence of steps easily can stretch over a five month period before installation begins.

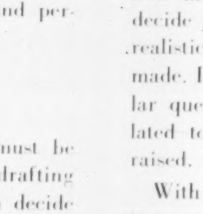
For a new building, once the bids are awarded, the contractor carries the responsibility for meeting the completion date. Delays in the design work may make inevitable a late start by the contractor. Under such circumstances, passing the responsibility for meeting the deadline on to the contractor does not get the air conditioning system into operation without the risk of costly overtime, substitute equipment and materials, and perhaps even inferior workmanship.

More Time for Existing Buildings

For a building that's occupied, more time must be allowed than is necessary for one that's on the drafting board. The owner of the occupied building can decide whether or not to go ahead with air conditioning only when the answers are available to such questions as:

- How much will it cost to install?
- How long will it take?
- How much will it cost to operate?
- How can it be done?
- How much space will be lost?
- How much will it interfere with present operations?
- Can it be done in stages?
- Will it mean changes in present lighting?
- How much of the work must be done on overtime?
- Does the building already have adequate electric power, steam, and water supply?
- Can the structure of the building carry the weight of the equipment?
- Will air conditioning require more operating and maintenance personnel?

The answer to the most important question, "How much will it cost?," will be determined largely by how elaborate a system is desired. Only summer cooling may be wanted. To handle fall and spring weather conditions, a more expensive system must be provided. An even more elaborate installation is called for when humidification during winter months automatically provides year 'round service.



It's relatively easy for a single tenant or tenant-owner to decide how elaborate or how simple the system should be. But it's a different story when the wishes of more than one tenant must be taken into account. In fact, the problem gets quite complicated when there are many tenants in one building, especially where individual floors are subdivided.

It's important for both owner and tenants to know how much rentals may be increased. The owner must decide just what he will furnish to the tenant before any realistic estimate of possible increase in rental can be made. Leases have to be reexamined. And a host of similar questions must be answered long before others related to mechanical and structural problems are even raised.

With such problems to face and to solve, it is easy to see the importance of allowing plenty of time for adequate preliminary investigation. If the initiative must come from the tenant, even more time is essential. For the tenant has to sell the owner.

Getting the Facts for Planning

To save time in arriving at the essential facts, to properly gage the merits of one possible step against another, to obtain a reliable estimate of cost, and to avoid early mistakes that may be later regretted—and expensive—calls for experienced counsel. For owner and tenant alike, the logical guidance is found in the air conditioning consultant.

One of the first steps of the consultant is to obtain plans of the building which show general arrangements and partitioning. He also seeks out the facts on leasing, specifically with regard to charges per square foot.

An early step taken by the consultant is to prepare a rough layout of the proposed installation. To develop this he must know

AIR CONDITIONING

By E. J. Benesch

Syska & Hennessy, Inc.
Consulting Engineers

ALLOW TIME TO TAKE THESE STEPS

1. **Survey building or plans.**
2. **Design air conditioning system.**
3. **Obtain bids.**
4. **Negotiate contracts.**
5. **Permit manufacture and delivery of goods.**
6. **Check drawings.**
7. **Coordinate general and mechanical work.**
8. **Supervise field work, resolve conflicts.**
9. **Approve the work, on paper and in field.**
10. **Test and adjust system for design performance.**
11. **Get system started and instruct operator.**
12. **Make final inspection of work of all trades.**

what lighting is provided, the number of people in each space, the size of windows, and similar data. He surveys the building to check structural strength and disposition of girders and columns and to find out what spaces might be used for mechanical equipment of the air conditioning system.

When the consultant submits sketches of the proposed scheme, his recommendations for the installation should be accompanied by budget estimates for the installation of the work and an analysis of the economic factors, including both fixed and operating cost. It is desirable that these costs be translated into cost per square foot.

It takes from two weeks to a month for a consultant to draw up such a report, complete with sketches. The time depends on the size of the building, the complexity of the spaces, and the tenants' businesses.

With such a report, the owner or tenant has all the fundamental information required to make the decision on air conditioning.

Set Up Program, Plan Installation

Much discussion must now take place between the consultant, the owner, and the tenant before a program of action can be agreed upon. Before planning of the installation actually gets under way, at least a month, and possibly two months, will have passed.

Planning, which takes even more time, involves working out answers to the following:

- How long will it take to prepare the working drawings?
- How much time must be allocated to the various contractors for preparation of cost estimates?
- What time allowance must be provided for negotiations of the contractor with the owner?

Planning and doing this work should not go beyond five months preceding the date the system should be ready for operation. For the average building, five months is sufficient but not excessive to make the actual installation.

Two common methods of proceeding with the work are on the basis of complete engineering drawings and on the basis of the consultant's sketches used in the preparation of the budget estimate which are accompanied by a qualifying specification.

The method of procedure depends on the complexity of the system, the type of building construction, and the owner's operation. It also depends on the extent of the general construction work.

Bids Made from Engineering Drawings

As results of the various essential surveys are obtained, work proceeds on the engineering drawings. These drawings get down to such specifics as the exact location of all equipment. They show the runs of piping relative to partitions and walls and show the runs of ductwork in relation to the lights, partitions, and headroom.

The engineering drawings also should indicate all information pertinent to obtaining competitive bids. Sufficient facts should be contained on the drawings from which contractors may estimate accurately.

Specifications should include such items as guarantee, the work schedule, testing, materials, appurtenances, automatic control of temperature and humidity, and remote controls for operating the equipment.

Both the drawings and the specifications should be reviewed by the owner and the tenant to make certain that their wishes are met satisfactorily and that they understand exactly what is proposed. In reviewing this material, the owner should consider future plans to be sure that the equipment and arrangement will with reasonable and minor modifications fit his ultimate program.

This article is condensed from a recent issue of a Syska & Hennessy, Inc. company publication.

Contract Negotiations May Take a Month

Time is required for negotiating contracts for either the complete engineering drawing method of procedure or the consultant's rough sketch method.

The consultant, working alone or in cooperation with the general contractor, selects three or four mechanical contractors who submit estimates for the work. Bidding or time for preparation of estimates requires between two and three weeks. Another week or so is required for adjustments, agreement on details, and the like, before the contract between the contractor and the owner is signed.

It is desirable at this point to bring in the individual who will operate the air conditioning plant that he may become acquainted with just what is in the contract. He will serve as a representative of the owner. While the installation is being made, he should be present to get thoroughly familiar with the location and operation of everything. Such an arrangement makes for more economical operation than one where the operator is brought onto the job after its completion.

What Installation Itself Involves

After the negotiations have been completed, the actual work of installing an air conditioning system begins.

The engineering drawings and specifications furnish enough data so that the equipment may be ordered. Delivery of equipment must be scheduled so that it arrives when it is needed.

Simultaneously, the contractor prepares erection or shop drawings. With completion of the individual erection drawing, it is submitted to the consultant for his approval before the work is fabricated. The contractor, upon receiving approved drawings, fabricates and installs such items as ductwork and piping.

Installation or erection of ductwork and piping, although an easy problem for mechanics, requires forethought and arrangement. That means, for example, making provisions for shifting occupants of certain spaces to some other temporary location while ductwork or piping is installed.

If the ductwork and piping are exposed, painting is necessary to provide a neat appearance. If this work is to be concealed, it must be furred in and the furring painted.

Time must be allowed for the contractor to adjust the various diffusers and grilles so that the quantity of air supplied or exhausted by each is in accordance with the consultant's drawings. This may or may not be a simple process. During the adjustment period, the refrigeration equipment is tested for leaks and performance.

Upon completion of the testing and adjustment, the consultant makes the final inspection, verifies that the system is performing as designed, and recommends its acceptance by the owner.

With all these unavoidable steps taking so much time, there can be no delay in getting started on any air conditioning system that's expected for operation 10 or 12 months from now. ≠

1956 Forecast

. . . (*Continued from page 124*)

More Welding Seen

The use of welding will be greatly extended in all segments of American industry, as a result of increased construction, says J. H. Humberstone, president of the American Welding Society and president of Air Reduction Sales Co.

Initial piping installations are making greater use of welded joints, he reports, "for reasons of practical service and economy." He cites especially the increased use of welding for small diameters of noncritical piping in general.

To Ship Less Steel Pipe

Standard steel pipe shipments in 1956 will be the same as, or only slightly under, those in 1955, which was an all time record, according to George D. Lain, research engineer of the Committee on Steel Pipe Research. This, of course, is because the use of standard pipe depends mainly on the amount of construction, and housing starts are expected to be lower this year.

More Copper Available

Increased supplies of copper are expected to become available early this year, according to T. E. Veltfort, manager of the Copper & Brass Research Association. Development of new mining properties and expansion of existing mines are expected to increase the output month by month for the next three years.

Demand for copper has been increasing steadily, he said, not only in the U.S. but throughout the world. This is because of expanding industrial development, increasing population, and a steadily rising standard of living. The growing importance of electronics, instrumentation, and automation require additional quantities of copper and copper base alloys.

Attack Air Pollution

Work will accelerate in air pollution control development in 1956, according to the Air Pollution Control Association. New sampling devices, methods of correction, and possibly a more realistic approach to air pollution problems will be evident. Part of this greater impact is federal legislation passed in 1955.

New emphasis will be given to the reduction of sulfur dioxide in stack gases. Also in the immediate future is increased attention to incinerator emissions. ≠

The Law and Your Profits

By William Hurd Hillyer

Not All Bid Requirements Are Law

When a bid is awarded to a competitor who seemingly failed to meet the requirements, it is best to proceed carefully before invoking legal redress. The law draws important distinctions between issuers of such requirements, as the following case reveals. All names herein are fictitious.

A county board of education advertised for bids covering a heating system in a new high school. Shortly after the ad's appearance, the architect mailed to prospective bidders a bulletin directing that certain supplemental specifications be incorporated. At the end of the bulletin was this:

"Furnish bid bond by reputable bonding company for 10 percent of the amount of bid. A certified check of 10 percent of the bid will be acceptable in lieu of bid bond."

Of eight bids received, the lowest was by Warmwell Equipment Co. for $82,324, and the next lowest was by Anonym & Sons for $83,784. No contract was awarded when the bids were opened. But the next day the superintendent of schools sent a letter to Anonym, returning their bond. He wrote: "It is likely that contracts will be concluded with Warmwell Equipment Co. in the near future."

Anonym didn't like this letter. He went to see the superintendent, who told him that the bonds and checks had been returned to the eight bidders. His curiosity aroused, Anonym was puzzled by the fact that the superintendent had kept the bonds of the lowest bidder for general construction and the lowest electrical bidder but had returned Warmwell's check. Upon investigation, he discovered that neither a bond nor a certified check had been furnished by Warmwell.

A month later Warmwell received the award. Anonym filed suit in circuit court, praying (1) that the board and Warmwell be enjoined from entering into or carrying out the contract, and (2) that the board be ordered to award the contract to Anonym as "the lowest legitimate bidder."

The school board admitted that Warmwell's bid was not accompanied by a bond nor a certified check when the bids were opened. But immediately afterward the board had been notified by a bonding company that a bond had been issued. The board declared that it was in possession of the bond when the contract was awarded. Board members, terming the award "neither arbitrary nor discriminatory," denied that it was the result of "favoritism" or "collusion," or that it was "an abuse of discretion." On the contrary, they claimed to be "motivated solely by a desire to protect the interests of the taxpayers."

Warmwell admitted lack of bond or certified check, but averred that its bid was accompanied by an uncertified check for more than 10 percent thereof. In addition, the company said it had tried to inform the superintendent by telephone that the bond had been authorized and was available immediately. However, it had been unable to reach the superintendent because he was in conference with the bidders. The bond was delivered three days later. The uncertified check for $8322.40 had meanwhile been returned to Warmwell on its assurance that "the bond would be forthcoming."

In lower court the chancellor held that (1) the board should have rejected the Warmwell bid because it did not comply with the specification and (2) the board should advertise for new bids. He enjoined the board from entering into any contract with Warmwell based on its bid. That company thereupon appealed, because the chancellor would not order the board to accept one of the other bids—that is to say, their own.

The appeals court drew a nice distinction between those mandatory requirements which a statute or ordinance lays down for the award of bids and those which have been formulated by an administrative agency.

The court held that, according to evidence, the successful and lowest bidder, though failing to comply with the architect's certified check specification, did thereafter furnish bond as requested. Therefore, no evidence of collusion, discrimination, or abuse of the board's discretion being seen, the chancellor's decree was reversed. Anonym's bill of complaint was dismissed.

‡

William Hurd Hillyer, author of this regular feature, is a contributor to a number of banking and financial publications and has written several books on business. A former vice president of the Atlanta Trust Co., his work there gave him a practical legal background.

[Note: While this discussion applies to an actual case, it should be remembered that legal rules vary in different states.]

DO NOT ENTER
PARKING
BUSES ONLY

LARGEST SNOW MELTING INSTALLATION in the U. S. serves 14 individual ramps on Boston's new $50 million aerial highway. Shop fabricated grids, 10 ft by 25 ft, of 1 in. pipes welded into 2 in. headers, cover more than 139,000 sq ft and total more than 200 tons. Photo courtesy Committee on Steel Pipe Research, American Iron and Steel Institute

How to Design and Install Snow Melting Systems

By F. F. Stevenson

• Each of the three main types of snow melting systems now in general use presents certain practical problems for which experience has only recently provided some answers. From the author's experience here are useful tips on piping systems, using either oil or antifreeze solution, and also on electric cable systems. Comparative costs, advantages and disadvantages are faced, as are the questions of what pipe materials to use, choosing a heating medium, deciding on the type of circuit, and determining the amount of heat required. Filling and draining problems, control and operation of various systems, and other aspects are also covered.

ARTIFICIAL MELTING of snow on pavements and entrances to business establishments is of great interest to the public. Stores, restaurants, banks, office buildings and others have found that snow melters have helped their business considerably during the winter months. The cost of these installations is often charged off to customer good will and the enhancement of public relations. Also, industrial plants, especially those located in suburban areas have found that installation of snow melters in pavements, parking lots and entrances, definitely improves labor relations.

The present cost of snow melting systems is probably a deterrent to their wide acceptance, but there is reason to believe that with increasing use, prices will be lower.

Three Types of Systems in Use

As to the practical design and installation of snow melting systems, there are three types now in general use:

1) Systems using pipes with an antifreeze solution as the heating medium.

2) Systems using pipes with oil as the heating medium.

3) Electric systems using heat transfer cable or wire mesh.

Each of these has its merits and demerits. Using pipe systems with an antifreeze solution such as ethylene glycol, the designer has the choice of ferrous or copper materials. With pipe systems in which oil is the fluid, ferrous pipe is generally used, since copper develops a catalytic action with oil at the temperatures used in these systems. All iron or steel valves and accessories are also required when oil is used.

With electric systems, no pipe is used except the conduit to extend the electric feeder lines to and from the snow melter sections. Such lines are usually installed underground in rigid conduit with protective covering.

Costs are Given

Piped snow melters, installed in the Chicago area, cost about $2.75 to $3.25 per sq ft of melting surface, depending on the kind of pipe used, the type of circuit, the heating medium, and how elaborate the control system is made. In areas with lower labor costs, systems may be installed for less. In my experience, I have found that copper tube systems may be installed at less cost than for melters using mild steel and wrought iron pipe. The reason for this is that the labor costs for copper tube serpentine circuit systems are lower.

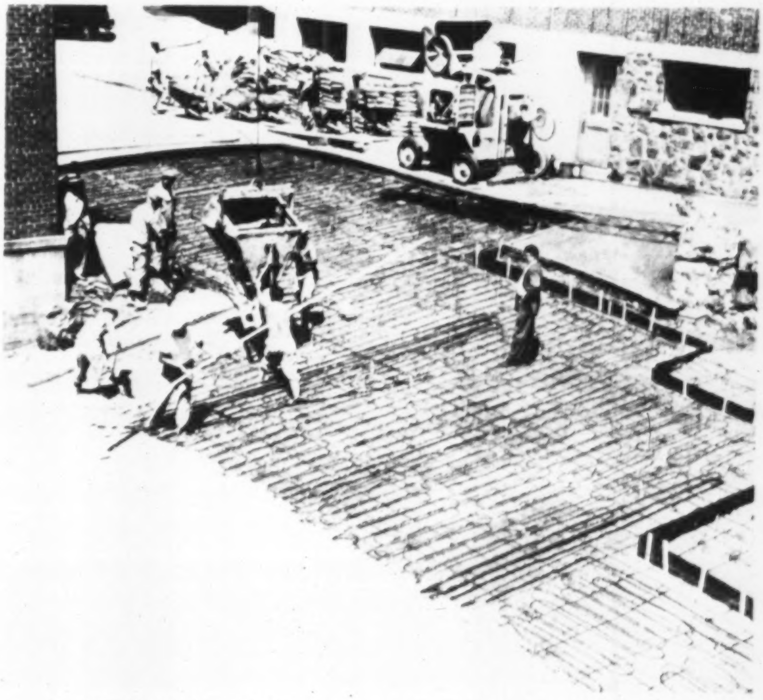
Mr. Stevenson has contributed many articles to HPAC for over 15 years. He is a design engineer, who has had wide experience in heating, ventilating and air conditioning. He has been engaged in contracting work and also with several engineering and architectural offices.

The cost of welding 1 in. or $1\frac{1}{4}$ in. iron and steel pipe is high, based upon my experience. On large jobs, it may be possible for the contractor to use equipment to speed up and lower the cost of welding ferrous pipe, but for small and medium sized systems the use of such equipment is usually not justified.

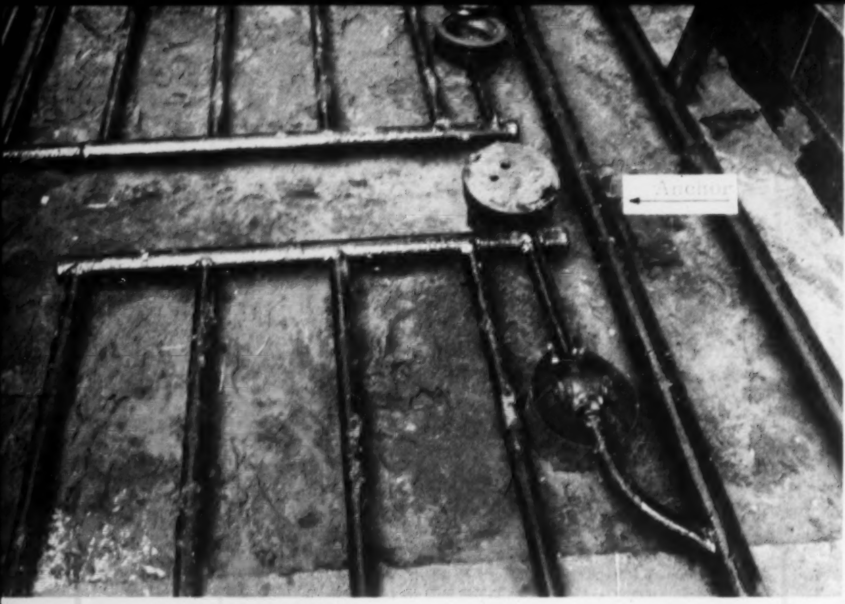
Copper tube, soft temper, may be obtained in 60 ft and even 100 ft coils and is comparatively easy to bend. This makes the labor cost for installing copper tube systems low. Joints may be made with 95-5 solder or silver brazed. The copper tube is rolled from the reel and return bends are formed where required, making it possible to have a long circuit without joints, except at supply and return lines and at balancing cocks and vents. Copper tube also has the advantage of being noncorrosive to glycol solutions, and it may be laid in crushed stone, even where soil drainage conditions are not too good.

Steel and wrought iron pipe may also be bent, but not as easily as copper, and with 20 ft lengths, the number of joints is much greater.

The first cost for electric melters is considerably less than for piped systems, but they have not been installed widely, perhaps because the monthly demand charge made by the electric companies causes the operating cost to be relatively high, especially on the smaller installations.



SNOW MELTING COILS consisting of pre-formed $\frac{1}{2}$ in. copper tube panel grids are shown here being installed in a trucking area of a New England plant. The grids, with standard 9 in. center spacing, are laid between parallel supply and return lines, and the system is embedded $1\frac{1}{2}$ to 2 in. below the surface of the concrete. Supply piping consists of 2 in. Type L copper tube trunk lines, with $1\frac{1}{2}$, $1\frac{1}{4}$, and 1 in. branches to the grid circuits. Reverse return lines of $1\frac{1}{4}$ and 1 in. Type L copper tubes run individually from each bank of grids direct to a balancing header. The reverse returns are necessary to assure an even flow through all the grids. Both supply and return lines release heat to the pavement. Photo courtesy American Brass Co.



PAVEMENT SNOW MELTER shows anchoring method used in the supply and return piping. Channel irons are welded to the pipe and embedded in concrete to a depth of 12 in. Flexible insulation is provided on the expansion joints

grid systems — generally used with ferrous pipe — is less than with serpentine systems on account of the shorter length of fluid travel and lower velocity. However, in the average system, the pumping costs are insignificant compared with the costs of steam. Therefore, high pressure drops may be considered unimportant, if economies in construction are achieved. However, it is desirable to not have serpentine circuits so long that too high a temperature drop in the fluid results. If this is the case, the action of the snow melter will be uneven. To compensate for this, more surface would have to be used in the sections served by low temperature fluid.

Pipe Embedding Recommended

When laying the pipes in heavy slabs — 6 to 9 in. thick — it is recommended that they be fully embedded in the concrete. With pavement or other light slabs — 4 to 5 in. thick — the pipe is sometimes laid in crushed stone under the slab. However, even with a light slab, embedding the pipe is the better method because of the greater heat transfer. However, the top of the piping must be from 2½ to 2 in. below the top surface of the slab where heavy truck and bus traffic is to be encountered. It is suggested, however, that when the melter is laid under the slab, steel pipe be not used. In laying wrought iron pipe under the slab, the ground should be free draining, as accumulated moisture will probably cause corrosion of the external pipe surface.

When using copper tube — 1 or 1¼ in. nominal size — in light pavement slabs, the tube may be laid in a loose crushed stone bed and with the concrete poured over the stone and tubing. The result is that the tube is actually embedded in about 1 in. concrete. If the tubing is to be completely embedded in a 4 in. pavement slab, no larger than 1 in. nominal size should be used.

Another method is to support the piping on steel or concrete chairs, with wire mesh laid on the pipes before the concrete is poured.

• *Choosing the Pipe Material*

The pipe for snow melters should be selected with consideration of installation costs, for its resistance to corrosion and for its structural strength when installed in areas with heavy truck and bus traffic.

Using a glycol solution, the designer has the choice of mild steel pipe, wrought iron pipe — both of standard weight — or copper tube Type L or K. Copper tube is noncorrosive in the presence of glycol solutions, but steel and iron pipe will corrode to some extent when in contact with the antifreeze solutions. Inhibitors are used, and the rate of corrosion is said to be slow, but it does take place.

With ferrous pipe, it is best not to embed it in concrete containing chemicals such as calcium chloride, since external corrosion of the pipe may result. Also, ferrous pipe used in supply and return lines should be laid in areas which are well drained.

However, when snow melting is to be installed in roadways or areas where heavy truck or bus traffic passes, it is suggested that ferrous pipe be given first consideration, on account of its structural strength.

For pavements, parking lots and similar areas, where the slab is not subjected to heavy traffic, copper tube, arranged in serpentine circuits, may be used to good advantage. Iron and steel pipe systems are often designed with grid circuits, each having a supply and return header with comparatively short connecting grid pipes. These require considerable welding.

The total equivalent length of serpentine circuits determines the pressure drop of the system which decides the amount of power required for the circulating pump. I have used circuits with actual lengths of 250 ft or more, and total pressure heads of 75 ft. With 1 in. nominal Type L copper tube and 1½ in. IPS steel pipe, the heat emission per lineal foot is about the same. Copper has the higher conductivity, but steel pipe has the greater surface per foot.

However, the heat flow through the concrete is actually the determining factor, as to how much heat is available at the top of the slab ready for useful work. Therefore, variations of heat emission from the pipe are not too important in relation to overall heat transfer.

With the same solution flow rate, the pressure drop per foot through the copper tube will be greater because of its smaller internal cross sectional area. The pressure drop in

• *Choosing the Type of Circuit*

In choosing the type of circuit — grid or serpentine — it is possible to give more accurate pitch to the grid than to long serpentine circuits. In grid circuits, the length of fluid travel is short and the velocity is low. It is sometimes quite difficult to install long serpentine circuits with the upward or downward pitch desired. This insufficient pitch may cause air pockets to form which cannot be drained. Once the piping is embedded, changes cannot be made.

When it is impossible to drain a melter by gravity, the lines may be blown out with compressed air. Once the system is balanced and working satisfactorily, it may not be necessary to drain it for a long time, maybe never. It will be noted that a number of snow melting areas can be best served by a system using a combination of grid and serpentine circuits.

The locations of the slab expansion joints must be known in advance and provision made for them in the design of the snow melting system. Heater circuits should not be installed through slab expansion joints. With pipe embedded in heavy slabs, it is often customary to install the supply and return lines in the slab on either side of the heater circuits. In these locations, such lines do useful work.

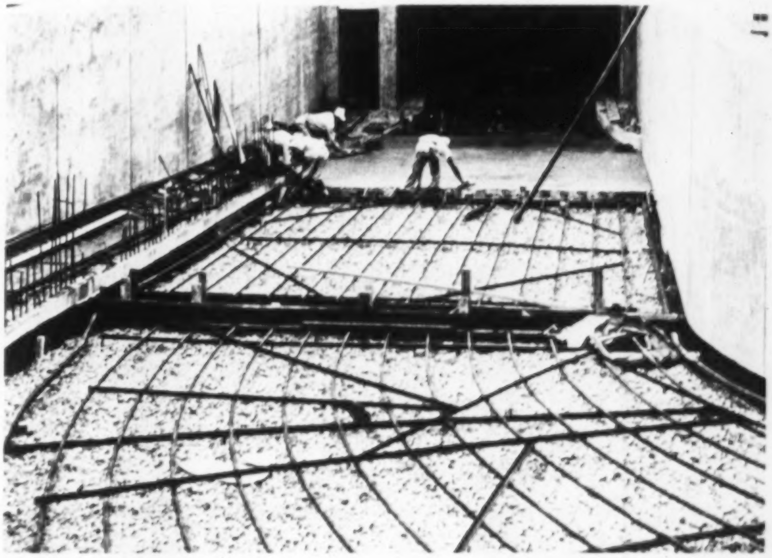
Provisions should be made in the design of the system to take into account the temperature drop of the fluid in long supply lines. In my experience, I have found that reverse return systems eliminate this problem because straight returns may be difficult to balance. However, with some systems, the matter of balancing may not justify the extra piping required.

Provide for Piping Expansion

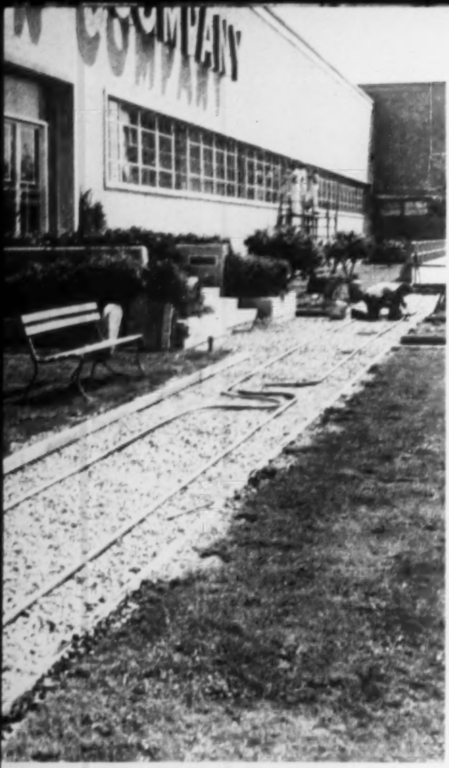
When supply and return lines are embedded, expansion loop offsets should be provided. The rate of expansion for ferrous pipe is about the same as concrete and that of copper pipe is somewhat greater. The expansion loops should be wrapped with some form of compressible material so that as the pipe tends to elongate at the loop, the movement will expend itself in compressing the wrapping. The pipes should also be properly moisture proofed where they cross the slab joints by the use of asphalt impregnated roofing felt. Supply and return lines should be anchored midway between each loop. Some designers anchor the circuits as well as the return and supply lines. With grid circuits having short travel, it would seem that circuit anchors are not necessary. Use a swing or offset connection between the circuit headers and the supply and return piping, and wrap the connections similarly to the expansion loops. This will allow for a difference in longitudinal movement between the grid circuits and supply and return lines.

With serpentine circuits, the number of return bends may be expected to absorb most of the expansion. But when the distance of straight pipe between bends is considerable, anchoring may help, as well as wrapping the bends to absorb movement. Supply and return connections in serpentine circuits may be treated in the same way.

Frequently, supply and return lines are not installed in the slab. One of the ways to install non-embedded lines is under the slab, in a bed of crushed stone. In this location, the system gets the benefit of some of their heat emission. Ferrous pipes, when not embedded, should receive a good coating of bituminous material. Expansion joints are necessary only every 75 to 100 ft. Anchors should be provided at proper locations. To prevent vertical movement of the slab, dowels may be inserted across each slab joint. These should be wrapped with impregnated felt and an air pocket provided for their longitudinal expansion.



GRID AND HEADER snow melters installed in bus ramps and roadways of the Upjohn Co., Kalamazoo, Mich., are wrought iron pipe embedded in a 9 in. concrete slab. Grid circuit has low pressure drop and a low solution velocity. Many welds are required with this design. Photo courtesy The Austin Co.



SERPENTINE TYPE of snow melter installed in a 5 in. pavement slab. This type has high pressure drops and comparatively higher solution velocities. Fewer welds are required. Photo courtesy The Austin Co.

• Choosing

Heat transfer oil may be purchased at about one fourth the price of the various grades of antifreeze solutions. However, about twice as much oil has to be used compared with antifreeze solutions. Ethylene glycol systems use about 50 percent water, while oil is used without mixing. The specific heat of the oil is about 0.50 Btu or less, compared with about 0.80 Btu for the average antifreeze solution. Therefore, for a given heat load and temperature drop, almost twice as much oil has to be pumped through the system. The actual amount of oil and antifreeze used depends, of course, on the volume of the piping, heater and connections.

The difference in the volume of flow required in a snow melter and a hot water heating system using an antifreeze will be discussed in detail later. Since oil requires about twice the flow, and with the pressure drop varying as the square of the flow rate, it is understandable that pumping costs will be somewhat higher with oil systems. To remedy this situation, the oil systems are often designed with shorter circuits than those used with antifreeze solutions. Of course, this increases the initial cost, but it must be weighed with the possible lower operating costs.

Oil, in addition to being noncorrosive to ferrous pipe, has the advantage of being stable under heat while ethylene glycol solutions are not recommended for use in converters with the steam or hot water supply over 250 F. Many designers recommend 225 F as the upper limit.

Before installing oil snow melters, it is suggested that the owner be re-

• Determining the Amount of Heat Needed

There are many methods used in determining the amount of heat required for snow melting. It is variable, depending on the outdoor temperature, prior to and during a snow fall, the thickness of the slab, the temperature of the heating medium, the spacing of the pipes, the time of warmup intermittent operation and finally, the rate of fall. The heat of useful work is that required to melt the snow. Much of the heat used does not go into useful work. There are losses to the ground and to the edge and back of the slab.

However, in calculating the amount of heat to put into the system, the snow load may be disregarded and in place of this, an amount of heat sufficient to warm up the slab through a given temperature range over a fixed period of time may be used. As most snow melters are designed for intermittent operation, just before and during a snow fall, this method of calculating the heat load is more realistic than any other. The heat required to bring an 8 or 9 in. concrete slab up to snow melting temperature in a reasonable time is much greater than that required to melt snow falling at an average rate.

The required temperature rise is the difference between the temperature of the surface of the slab before the snowfall and that required to melt snow. In the middle west, the air temperatures just before and during snowfall vary between 20 F and 35 F. An average value of 24 F is often used with a slab design temperature of 36 F, resulting in a temperature rise of 12 F. The time usually allowed for warmup is between an hour and an hour and a half. If the weather predictions are accurate, a long warmup period may be used, but this may not give time enough to raise the temperature of the slab sufficiently to melt snow until it has been falling for some time. This results in poor performance of the system.

Using the slab warmup method of determining the heat load, the temperature of the solution may be decreased considerably as soon as the surface is up to temperature. Also, if the outdoor temperature is higher than normal before the snow fall, a similar reduction in solution temperature may be made.

For heavy roadways, a heat input from 200 to 225 Btu per sq ft of slab per hr has been used with good success. With light pavement slabs, a heat input from 125 to 175 Btu is satisfactory. The heat input must be increased when the heating pipes are under, but not in, the slab.

For slabs of constant thickness, the larger the pipe used, the greater the spacing. But as larger pipes are generally used in heavy slabs with higher heat input requirements, pipe size and spacing usually balance out. In

the Heating Medium

quested to check with his insurance company, especially if the heater is to be located inside a building in congested business areas.

Heating Mediums Compared

In selecting a steam converter to heat an ethylene glycol solution, it is well to remember that the heat transfer rate between the solution and steam varies considerably from that between water and steam. This is due to the differences in specific heat and in viscosity of the two fluids.

The average converter used in hot water heating systems, with copper tubes and with water in the tubes and steam in the shell has an overall heat transfer coefficient of approximately 500 Btu per hr per sq ft per F. This will vary somewhat due to the size of converter tank; size of the tubes, velocity of the water, diameter of the tank and sealing of the tubes.

With an antifreeze solution in the converter, the heat transfer rate drops to about one-half of that for water. Therefore, almost twice as much heating surface is required in a converter when it is used with a snow melting system as when it is used for hot water heating, with the temperature rise the same in each case.

When heat transfer oil is used, the converter must be even larger than with an antifreeze solution. The heat transfer rate with oil is only about 25 percent of that with water and much more oil must be heated.

Also, when a converter is used to heat an antifreeze solution, low pressure steam must be used. With temperatures over 235 F, the corrosion inhibitors in the solution tend to break down and the corrosion rate will swing sharply upward. Steam temperatures of 250 F should be considered maximum.

In calculating the amount of antifreeze solution required for a given heat load, the difference in the specific heat of the solution and that of water must be considered.

In the middle west, a 50 percent solution is commonly used, and it has a specific heat of 0.8 Btu per lb per F. In other words, when its temperature falls 1 F, it gives up 0.8 Btu compared to 1 Btu for water. Thus, with equal flows of solution and of water, with both having the same temperature drop, the solution emits only 80 percent of the heat given off by water. Therefore, the amount of solution cannot be calculated by the same formula as is used for water. It is common practice, if a 20 F drop in solution temperature is to be used for peak loads, to calculate the amount of solution on the basis of 15 F drop in temperature.

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my practice, I have found that 1¼ in. or 1½ in. pipe is satisfactory for heavy roadways on 14 to 18 in. centers. For light pavements, 1 in. or 1¼ in. pipe on 12 to 18 in. centers works out very well. The temperature of the heating medium is also a factor in the spacing. The heat emission from the heating medium to the slab itself is also a variable.

Also, the amount of heat lost to the ground below and at the sides of the slab must be considered. During the warmup period, much heat is lost at the top of the slab to the ambient air.

Surface Drainage Important

In order to calculate the pipe surface required, a figure of 3 to 3.5 Btu per sq ft of pipe surface, per deg temperature difference per hr for ferrous pipe and 4 to 4.5 Btu for copper tube may be used. These figures vary with diameter, spacing, and temperature difference.

Draining the water off the surface of the roadway or pavement, as the snow melts is an important part in the design of snow melters. Roadways are generally pitched for proper drainage and present no problem if the water can be directed into openings, culverts, ditches or other drainage facilities. Pavements and other flat surfaces such as parking lots should be planned carefully, so that the melted snow may have easy access to drainage openings. If the water runoff from the surface of a snow melting system is not prompt, a lot of efficiency is lost.

Pitch and Drainage Provisions

Balancing cocks are generally placed in every circuit, and sometimes two are provided — one on the supply side and one on the return.

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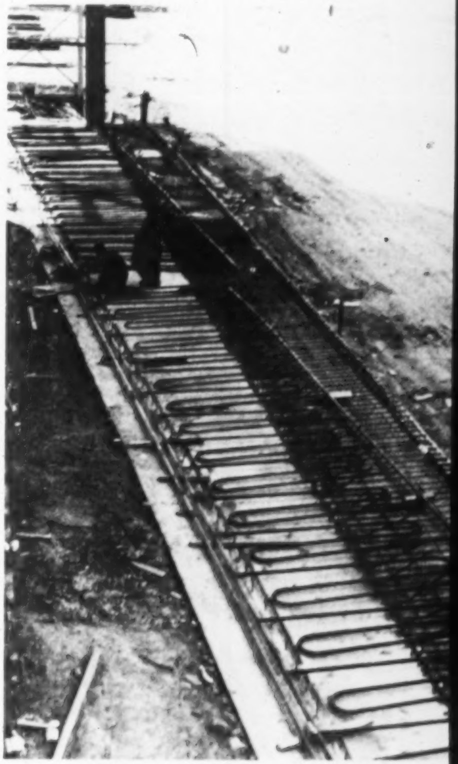


CONCRETE APRON warmed by antifreeze circulating through wrought iron coils serves hangar doors at the Grumman Aircraft Engineering Co., Riverhead, Long Island, N. Y. Photo courtesy A. M. Byers Co.

(Continued from page 173, bottom)

With this arrangement it is possible to isolate any one circuit from the rest of the system. One or more air vents should be installed at high points in the system. An air vent in each circuit is often an aid in filling.

The heating equipment is frequently in the basement of a building, and this establishes the low point of the system for drainage.

However, when snow melters are installed in parking lots, airplane runways and roadways, the heating equipment may be in a building with no basement, so that the heater will be at an elevation higher than the piping system. These systems can still be graded up to the end, and the low point for drainage can be established at the beginning of the first circuit. Some systems have a low point at the farthest end, but draining at this point is not too convenient.

• Solving the Filling and Pressure Problems

Filling the system when an antifreeze solution is used may pose some problems. The snow melting system must be filled twice; that is, approximately one-half of its volume with water and the other half with antifreeze. The water filling procedure is similar to that of any hot water heating system. Simply connect the snow melter piping to a water supply line having pressure, and open the valve. The antifreeze, however, comes in barrels or drums, and it may be inconvenient to get it into the system unless the designer has made proper provision for filling.

The problem of filling depends upon the type of system, whether open or closed, and also on the pitch of the piping.

My preference is an open system, with the expansion tank connection on the suction side of the pump. If the tank can be placed high enough above the highest point in the system, then the vertical pipe leg to the tank will afford sufficient static head to push any liquid introduced in the tank out to the end of the last circuit. Therefore, the antifreeze may be dumped — through a suitable open connection — into the tank and the filling problem is solved. The antifreeze should be introduced before the water. Since it will fill only half of the system, the static head is only that required to drive the antifreeze half way out in the system.

At filling temperature ethylene glycol is a little over 10 percent heavier than water. However, with the heater in the basement below the level of the piping, it may be impossible to locate an open expansion tank high enough to be used as a filler.

If this is the case, a closed expansion tank is used at low level, with the tank connection on the discharge side of the pump. A fill connection is placed in the line, and the antifreeze is pumped into the system with a portable pump. It is not recommended that the melter pump be used for this purpose. After the antifreeze is in the system, the water is introduced under line pressure until the system is filled. The water connection must be a temporary one; health codes forbid a permanent connection.

Correcting Pressure Drop

Pressure drop in the system may be important especially in long serpentine circuits. At temperatures around 150 F and 160 F, there is not much difference between the drop of the solution and 100 percent water. A 10 percent safety margin will cover it. But if the system is to be used with lower temperatures for lower loads, say around 125 F, the pressure drop of the solution will be greater and an increased factor of about 20 percent should be used. That is, the pressure loss may be calculated from reference tables giving the loss with water and then 20 percent added.

With oil systems, about twice as much oil is required and with a given size of pipe, the pressure drop will increase as the square of the flow. Therefore, snow melters using oil should have shorter circuits than those using antifreeze.

Pumps handling ethylene glycol solutions should be equipped with good mechanical seals, as the solution will leak through standard pump packing. Also, there have been reports of the siphoning out of antifreeze solutions from snow melting piping, apparently by those who are looking for automobile antifreeze at no cost to themselves. This can be done, if such people are able to get at locations in the piping where they can break open a cock, vent or fitting.

All valves used in antifreeze snow melters should have deep stuffing boxes and good packing with a follower gland to prevent leakage.

• Figuring the Operating Costs

The cost of operation of a snow melter is a matter of concern to the owner. The type of system commonly used is an antifreeze solution type with a low pressure steam converter and a pump driven by an electric motor. Therefore, the two principal items of cost are steam and electric power, with the former being much the larger of the two.

The quantity of steam used depends on the amount of heat being put into the slab per unit of time, with the efficiency of the converter and piping system being an important factor. Also, as stated before, the thickness of the slab, location of the pipes and time allowed for warmup are important items. At peak loads, the amount of low pressure steam required for 100 sq ft of slab runs from 16 to 25 lb per hr. If the system is handled properly, it will not be necessary to operate at peak load at all times. In fact, a usage factor of 0.75 or even less may be used in calculating the overall steam consumption.

With steam costing, say, $1.00 per 1000 lb, or 0.1 cent per lb, it will be noted that steam cost may be something in the order of 1.2 to 2.0 cents per 100 sq ft of surface per hour.

Pumping costs are but a small fraction of the cost of steam. For instance, a system having 2000 sq ft of surface, with an average temperature rise in the solution and an average pressure drop, will use about 40 gpm of solution with a 1 or $1\frac{1}{2}$ hp motor.

Current consumption for the entire melter will run about 0.9 to 1.3 kw per hr, with the higher figure for systems having long circuits and high pressure drops. Make sure that the motor is sized on a liberal basis, because the pump starts when the solution is cold and the pressure drop of the system is at its highest level.

Electric Type, Pro and Con

Electric snow melting systems are not nearly as common as piping systems. In fact they are "few and far between." Electric systems, using wire mesh or heat transfer cable embedded in the slab, have been installed in some locations, notably in roadways in the state of Michigan. They can be installed more cheaply than piped systems, but do not seem to have "caught on" as yet. The heating or piping contractor naturally does not push them, and neither do the electrical people.

The cost of current per 100 sq ft of slab may range from 2.5c to 3.5c per hr, depending on the electric rate and subject to the application of an efficiency rating as described below. One of the handicaps to the use of electric systems is the monthly demand charge of the electric companies. This is based on the peak electric demand and sky rockets the cost of electric systems in some localities. I worked on one installation of approximately 15,000 sq ft, and the monthly demand charge was $1400.

The heat used in the slab of an electric system is about the same as required for piped systems.

In Michigan, the state highway department has used heating elements of 14 gage, 2 in. mesh, galvanized wire, 18 in. in width.

To connect the heating elements to the source of power, the wire is welded to $\frac{1}{4}$ in. × 2 in. copper bars, which in turn are brazed to terminal wires. Two lengths of mesh are used in a 12 ft roadway, with from 50 to 70 watts of current per sq ft of mesh. These systems are obviously designed to melt snow from two sections of the roadway in the track of automobiles and trucks. For snow melting on pavements, parking areas and the like, the wire mesh must extend over the entire area of the pavement. But with such treatment, it is no doubt feasible to use less wattage per sq ft of mesh.

• *Controlling the Snow Melter*

The Michigan snow melters seem to be working out very well. They started out wih automatic control, but after a period of use it is reported they are using manual controls. Of course, the cost of operating systems of this sort depends entirely on what is paid for electric current and whether or not there is a demand charge. A later report from the Michigan highway department states that the wattage used was about half of the design figure. The experience with these systems confirms the writer's opinion that thermal control of snow melting systems is not practical, because snowfall occurs at many temperatures, say up to 38 F.

The difference between the design and the actual wattage does indicate that the efficiency of the electric mesh systems in regard to heat transfer is higher than expected, and when designing an electric system, it may be satisfactory to use a substantial usage efficiency factor, perhaps larger than that used with piped systems. This of course will result in worthwhile savings, both in intial and operating costs.

Another method of electric snow melting uses lead sheathed heating cable. This cable is laid out just like pipe, embedded in the slab, with suitable connections to a source of current. From one supplier, this cable comes in 60 and 120 ft lengths; the former length has a rating of 400 watts. Cable should be calculated on the basis of 45 to 65 watts per sq ft of slab to be heated.

It will be noted from the above, that based on current consumption alone, the operating costs of electric systems will be higher.

Most melting systems are started and stopped manually. Automatic devices of various kinds have been offered for use, but so far none seems very practical. It is most desirable that the system be turned on before a snowfall. The person in charge of the snow melter has to rely on the accuracy of the weather forecasts in order to economize on the consumption of steam. It is also desirable to use a modulating valve to control the flow of steam. This can be done by a thermostat, with its thermal bulb in the hot water discharge line. The manual starter simply gives control of the steam valve to the thermostat and, of course, starts the pump. The control system may be either electric or pneumatic as desired. The setting of the thermostat should be determined by a trial and error method, and after the slab has been brought up to temperature, the thermostatic setting can usually be lowered materially.

After a snowfall, the system should always be operated until all moisture has been evaporated. ⊹

Question of the Month

How Can I Size Piping for Steam Unit Heaters?

THE QUESTION, *How To Size Piping for Steam Unit Heaters?*, was asked previously in HPAC and is repeated here along with an answer that has been received. Other answers for publication will also be welcome.

"Where can I find specific information on pipe sizing for unit heaters, especially return pipe sizes when a condensation return pump is used?

"What pressure drop should be used when the unit heaters are selected on the basis of a steam pressure of 2 psig, and on the basis of a steam pressure of 5 psig?

"Can any reduction in return pipe sizes be made because a condensation return pump is used?" C.R.W.

H. B. WAYNE—

"Distribution of Steam Should be Rapid, Uniform"

UNIT steam heater rating is standardized by code, based on 2 psig dry saturated steam at the heater coil, with air entering the heater at 60 F at 29.92 in. Hg and the heater operating free of external resistance to air flow. The capacity of a unit heater increases as the steam pressure is raised, and it decreases as the entering air temperature increases.

Tabular values of conversion factors are available which allow estimate of unit heater capacity with different steam pressures and entering air temperatures. For a blow-through type of unit heater where the fan forces air across the heater coils and with an entering air temperature of 60 F, use of 5 psig steam gives a multiplier factor of 1.05, or a capacity increase of 5 percent over a heater employing 2 psig steam.

Operating with the same thermal conditions, a draw-through heater—air induced across the coils—will also give a 5 percent increase in capacity. However, for most conditions, the blow-through design will give a greater capacity increase as compared with the draw-through type. When considering alternate steam pressures, it is important to ascertain if the heater is suitable for the higher pressure and if the resulting increased outlet temperature is acceptable. This information should be obtained from the unit heater manufacturer.

Rapid condensation of steam prevails during starting up periods and therefore the condensate returns must be sized so as to be sure of keeping the heating coils free of condensate. Similarly, the steam piping to the heaters needs to be large enough to convey the required steam to replace that which has been condensed. When a unit heater fan is operated under start-and-stop control and where all or part of the air is taken from the outside, the condensation rate may vary rapidly, which is another consideration that must be taken into account when selecting pipe sizes.

By installing a pump and receiver system for the condensate, the air and other non-condensables may be removed by individual air valves on the heaters, or it may be carried in the returns as are commonly used with a vacuum system. Thus, the entire return system is free-vented to the atmosphere. This arrangement requires all units, drip points, and radiation to be trapped to prevent steam from entering the returns.

The standard method of unit heater control is by employment of a two-position on-off control by means of a thermostat. A limit control is recommended to prevent operation of the heater fan motor when steam is not available. The limit control may be either a surface thermostat or a pressure control. If there is no possibility of drafts, and continuous air circulation is necessary, the fan motor may operate continuously. With this arrangement, a room thermostat is generally connected to the steam supply line so as to proportion the steam flow.

The piping systems should be designed to provide distribution of steam, return the condensate, and remove air and other non-condensing gases where local vents are not provided. Steam distribution should be rapid and uniform without noise. Release of air should be facilitated as much as possible, since an air bound system will not heat readily nor properly. Equal resistances in the supply and return systems are desirable. It is suggested that the piping be designed so that the total distance from the boiler to the heater is the same as the condensate return distance between the heater and the boiler. This will help to obtain smooth operation without these problems.

Pipe connections and mains for unit heaters are sized in accordance with the steam quantities condensed by each heater. Knowing steam quantities and the physical arrangement of the piping systems, C.R.W. can calculate the required pipe sizes. A

(Continued on page 178)

Animal Comfort To Vie Human?

Air conditioning for man and beast was the subject of several papers at the 51st annual meeting of the American Society of Refrigerating Engineers held recently in Atlantic City. Abstracts of three papers are presented here.

1. People Today Demand Year 'Round Thermal Comfort

People today, especially in the U.S., demand year 'round thermal comfort, said Prof. M. K. Fahnestock, Physical Environment Unit, and Dr. Jane E. Werden, Associate Professor of Home Economics, both of the University of Illinois, in their paper, "Environment, Comfort, Health, and People."

Thermal comfort involves heat production within the body, the transport of heat from deep body tissue to peripheral tissue, and the transmission of heat from peripheral tissue to the surroundings. In general, people are thermally comfortable when their heat loss and heat production are the same. Degree of activity, clothing, and ingestion affect the rate of heat production. Environmental mean radiant temperature, dry bulb temperature, humidity and air movement control the transmission of heat from people.

In uniform environments with air movements of the order of 25 fpm, sedentary or slightly active healthy men and women normally clothed are comfortable the year 'round when the dry bulb air temperature is between 73 and 77 F and the relative humidity is between 25 and 60 percent. The ASHAE comfort chart and effective temperature greatly overemphasize the effects of relative humidity on comfort in this range of dry bulb temperatures.

The adjustments in the heat regulatory mechanisms of the bodies of healthy people on entering and leaving air conditioned spaces are prompt, easy, and safe. Thus, indoor conditions can be maintained at comfortable levels without regard to the outdoor conditions and without affecting the health of the occupants.

Most of the existing data pertaining to the levels of the environmental factors which affect human comfort is limited to sedentary or slightly active healthy young men and women. Similar data is needed for people working at various rates and showing the effects of air conditioning on efficiency.

Additional data is also needed to fix the range of air velocities which are satisfactory for comfort heating and cooling; to measure the mean radiant temperatures of nonuniform environments; and to evaluate the effects of the wide difference in the weight of clothes worn by men and women.

2. Cooled Slab Reduces Heat Stress in Swine

Heat stress in swine can be suitably reduced by a slab cooled by mechanical refrigeration, it was found in a study of the economic feasibility of providing a partially controlled environment for swine. This study was reported in the paper, "It Pays To Provide Comfort Cooling for Hogs," by W. E. Fontaine, F. N. Andrews, and W. L. Sibbitt of Purdue university; C. E. Glackman of International Harvester Co.; and S. J. Williams, Jr. of Whirlpool-Seegar Corp.

It was found that a slab of 500 sq ft will accommodate a herd of 50 to 75 swine. For this size herd, a 2 hp condensing unit would be needed. A detailed cost analysis was included in the report.

Swine were chosen for this study because they do not sweat at all. In sustained high ambient temperatures they are subjected to extremely high heat stress, resulting in a decrease in growth and a decrease in the efficiency of feed conversion.

Feeding experiments in summer indicated that fluctuations in feeding efficiency were related to temperature. Under normal field conditions, feeding efficiencies decreased as much as 54 percent, whereas the normal decrease due to increased weight would have been only about 12 percent. If the decrease in feeding efficiency that occurred as a result of temperature could have been eliminated, the weight increase would have been approximately 15 lb per swine and the feeding period would have been reduced to less than 100 days.

Cooled pigs gained approximately 0.30 lb per day more than pigs which had access to shade but no refrigerated slab.

3. Climatic Control of Poultry Houses at Hand

The day of climatic control of poultry houses seems near, predicted W. O. Wilson, Associate Professor, Dept. of Poultry Husbandry, University of California, in his paper, "Effect of Environment on Chickens."

To produce husky chicks from fertile eggs, proper control of temperature, humidity, ventilation, and turning are necessary during incubation. After hatching, chicks are not completely homeothermic and need proper control of brooding temperature and other environmental factors. As chickens become older they become more resistant to cold but more susceptible to high temperatures.

Large numbers of hens are lost annually due to lack of acclimation. When the air temperature is over 85 F, the hen is not able to prevent her temperature from rising. The effects of high temperature are reduced egg production and egg weight and thinner shells. Besides plenty of shade and cool drinking water, the use of fog nozzles to provide hens with artificial sweat has been commercially accepted for protection against hot weather.

Hens require less light than formerly thought necessary. Reducing the light would simplify cooling two ways: the hen would be less active, and the light would be off most of the time. ‡

Question . . . .

(Continued from p. 176)

total pressure drop of 0.5 to 1.0 psi for the entire steam circuit is a value recommended for good performance. If steam is furnished for direct and indirect heating, it is well to have the steam to the unit heaters supplied by a separate piping system. This is preferred rather than connecting them to the piping which furnishes steam for direct radiation.

Condensate return pumps are frequently used when local conditions will not permit the condensate to return to the boiler by means of the available static head. Since the physical dimensions of the plant have not been stated, a condensate return pump having a head capacity of 2.5 to 10 ft may be installed which will allow a reduction of pipe sizes, when compared with a gravity system. Knowing the flow rates, C.R.W. can select proper pipe sizes to meet the recommendations given above.—H.B. Wayne, Consulting Engineer.

The Question, *Why Does Vacuum Heating Pump Clatter?*, was asked previously in HPAC and is repeated here along with an answer that has been received. Other answers for publication will also be welcome.

"We have a steam driven double acting vacuum return line heating pump that has given noise troubles since it was moved to the boiler room from a room about 160 ft away and 8 ft lower in elevation.

"Previously, when the pump offered no problems, it received condensate from the 15,000 sq ft of radiation by gravity and delivered it up the sloping incline of 160 ft of 2½ in. return line to the boiler room. Now the pump races and clatters at certain times.

I would like to know what is causing the trouble, and if it can be corrected without returning the pump to the lower elevation."—G. A. N.

Two answers to this question appeared on these pages in the December 1955 HPAC.

CLIFFORD F. BISHOP—

"Move Pump To Where It Can Pump, Not Lift, Water"

The trouble that is being experienced in this is that the hot water is flashing into steam.

With 160 ft of 2½ in. pipe, assuming one globe valve in the suction line to the pump, approximate capacity 50 gpm, a vacuum of 6 in. Hg. in the suction line to the pump, 2 ft pressure drop through the inlet valves of the pump, and 8 ft vertical elevation, the absolute pressure in the pump cylinders would approximate 5.5 psi. At this pressure steam will form at 167 F. The condensate being returned to this pump is probably at least this temperature.

The only practical answer to this problem is to move the pump back to its former position where it can pump the water instead of lifting it.
—Clifford F. Bishop, Engineer.

READER ASKS —

"How Can We Collect Oil Mist?"

"We are trying to determine the most suitable method for collecting the mist emanating from the contact of cutting oil against high speed grinding spindles in our plant. Because of several reasons, we are not in a position to use the electronic type of precipitator.

"We would like to hear from other HPAC readers as to what their experiences have been on similar problems. Any other information that would be helpful to us in arriving at a satisfactory solution to this problem would be appreciated."—C.N.

- *YOU ARE INVITED to contribute a question for publication, or an answer to a published question. Please address your reply to the Editors, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2.*

Tear out along this line

How To Size Trunk Ducts Without Knowing Air Quantities

. . . in branch ducts

By James F. Burton
Engineer,
Kroeschell Engineering Co.

A PROBLEM frequently encountered in duct design, particularly when redesigning an existing system, is to determine, without knowing the air quantities, the size of the main trunk duct if it is to have the same friction drop per foot as the ducts connected to it.

This problem can now be solved with a minimum of calculation by using the curves on the next page.

First the analysis. By referring to the standard ASHAE chart on air duct sizing, it is found that the air quantity, Q, is related to the equivalent diameter by the equation:

$$Q = kd^{2.55} \quad \ldots\ldots [1]$$

where k = a constant value for each friction drop — such as 0.10" per 100 ft — its actual value depending on design conditions.

Now, let Q_1 = air flow in Branch Duct No. 1, with equivalent diameter d_1; Q_2 = air flow in Branch Duct No. 2, with equivalent diameter d_2; Q = air flow rate in the main trunk duct, with equivalent diameter d.

We know that:

$$Q = Q_1 + Q_2 \quad \ldots\ldots [2]$$

and

$$Q_1 = kd_1^{2.55} \quad \ldots\ldots [3]$$

$$Q_2 = kd_2^{2.55} \quad \ldots\ldots [4]$$

$$Q = kd^{2.55} \quad \ldots\ldots [1]$$

$$\begin{aligned} Q &= Q_1 + Q_2 \\ &= kd_1^{2.55} + kd_2^{2.55} \\ &= kd^{2.55} \end{aligned}$$

The factor k can be cancelled out, leaving:

$$d^{2.55} = d_1^{2.55} + d_2^{2.55} \quad \ldots\ldots [5]$$

Thus, the equation is independent of k, and is true for any friction drop. Hence, k does not have to be known.

Taking square roots on each side (and since 1/2.55 = 0.392):

$$d = (d_1^{2.55} + d_2^{2.55})^{0.392} \quad \ldots\ldots [6]$$

Then, d is plotted against d_2 for various values of d_1. An example will show how to use the chart.

Suppose that a rectangular branch duct has an equivalent diameter of 12 in. and another rectangular branch duct has an equivalent diameter of 16 in. From the graph, the line marked 12 in. intersects the d_2 scale of 16 in. at the point where d is 18.6 in. This is the equivalent diameter of the main trunk, the branches being 12 in. and 16 in.

If the same problem were worked out using equal velocities, d would come out to be 20 in. instead of 18.6 in. In other words, by using this new chart, a smaller duct size is obtained, with a possible saving in sheet metal.

It is interesting to compare the graphed results with a similar problem, holding the velocity constant. For equal air velocities in the ducts, air quantity is equal to the velocity times the area, since air is considered incompressible in this type of work.

If d is the equivalent diameter of the duct,

$$Q_1 = \pi d_1^2 V_1/4 \quad \ldots\ldots [7]$$

$$Q_2 = \pi d_2^2 V_2/4 \quad \ldots\ldots [8]$$

$$Q = \pi d^2 V/4 \quad \ldots\ldots [9]$$

But, if velocities are held constant, V_1, V_2, and V will be equal. As before, the sum of the quantities in the two smaller ducts is the quantity in the large one. Or,

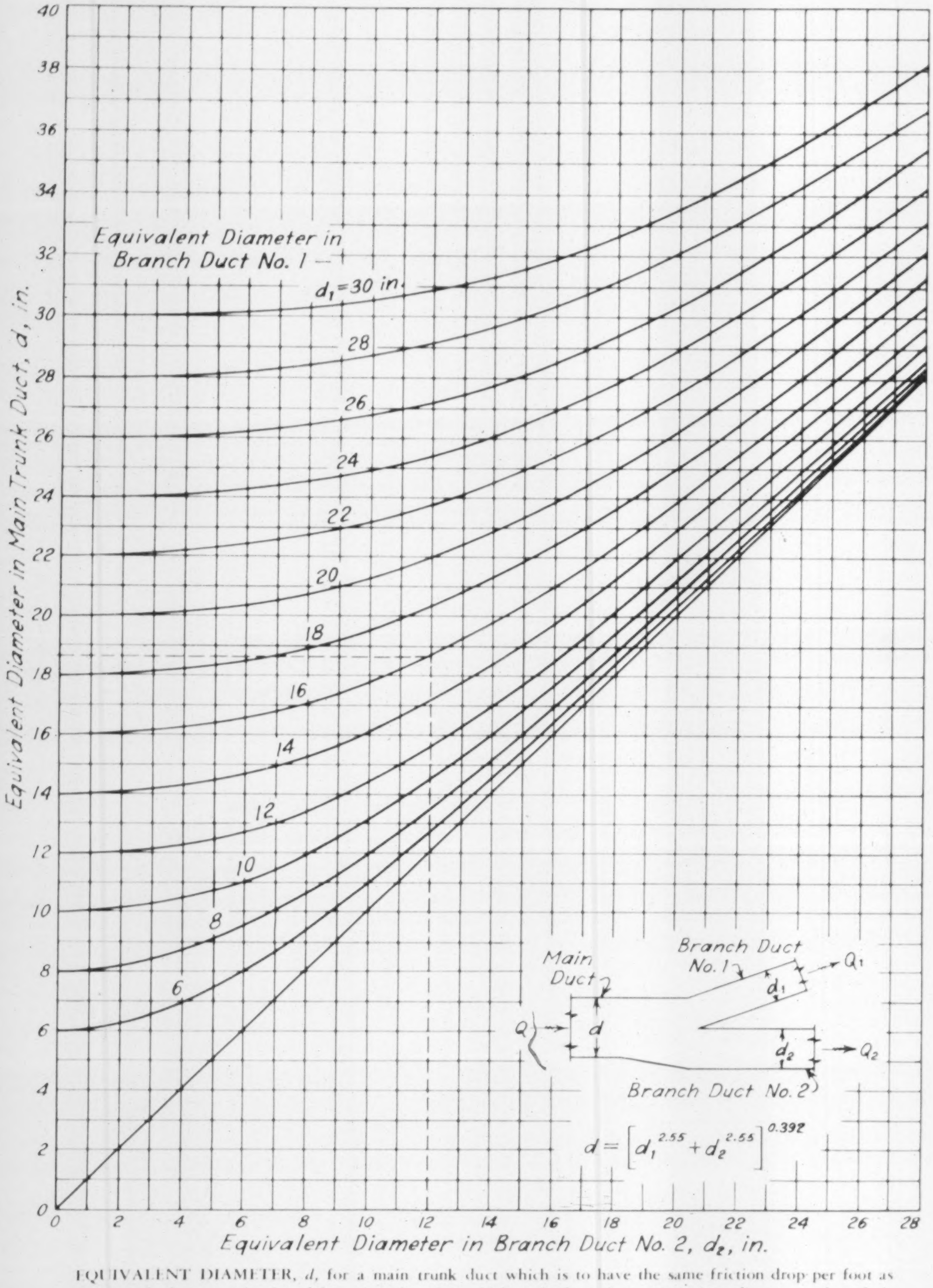
$$\begin{aligned} Q &= Q_1 + Q_2 \quad \ldots\ldots [2] \\ &= \pi d^2 V/4 \\ &= \pi d_1^2 V/4 + \pi d_2^2 V/4 \end{aligned}$$

Since the factor $\pi V/4$ occurs on both sides of the equation, it may be cancelled out, leaving:

$$d^2 = d_1^2 + d_2^2$$

$$d = (d_1^2 + d_2^2)^{0.500} \quad \ldots\ldots [10]$$

Compare this with Equation 6.



EQUIVALENT DIAMETER, d, for a main trunk duct which is to have the same friction drop per foot as the branch ducts can be found by using this chart. If branch ducts have equivalent diameters, d_1 and d_2, of 12 and 16 in., respectively, the equivalent diameter of the main duct will be found at the intersection of the d_1 and d_2 scales, or 18.6 in.

HEATING, PIPING & AIR CONDITIONING
AMERICAN SOCIETY OF
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NOISE PRODUCTION AND DAMPING IN WATER PIPING

By W. L. Rogers*, Evanston, Ill.

This paper is the result of research sponsored by the American Society of Heating and Air-Conditioning Engineers, Inc., in cooperation with Northwestern University, Evanston, Ill.

SUMMARY: This progress report presents experimentally-determined sound-pressure levels for noise produced in the water inside pipes by flow through 1½-in. straight pipes and various fittings. Correlation of previously-obtained 1-in. data and the current 1½-in. data are presented for straight-pipe runs and for orifices. The effect of water temperature on flow-noise production is discussed briefly. Tests of a 1-in. circulating pump are presented for comparison of noise levels with those produced by flow through pipes and fittings. The effects of water temperature, velocity, and system pressure on pump-noise production of the sample pump are discussed. Finally, sudden enlargements are preliminarily evaluated as liquid-path acoustic filters; and probable proper future activity of this study is indicated. Some tentative and preliminary conclusions are included.

THE PRIMARY purpose of this progress report is to summarize the activity and developments of the past year in the project. Two previous reports[1,2] have summarized the preliminary planning, some of the experimental apparatus and instrumentation, and experimentally-determined sound-pressure levels and frequencies produced by flow of cold water over a range of velocities through 1-in. pipes and fittings, including orifices. The information presented here should not be viewed as constituting a terminal report on any aspect of the problems under investigation, but only as a report of progress.

The basic instrumentation and procedures are essentially like those discussed in the 1954 report on this project. All sound measurements were made by means of a microphone mounted through a hole in a slightly flattened area of the pipe wall, essentially flush with the inside surface. Thus the noise *in the water* was measured. Such a procedure allows evaluation of pipes and fittings as *noise-producers*, leaving the manners in which this noise is amplified, transmitted, damped, or becomes airborne as separate problems. The total problem thus is divided into its natural subdivisions.

The decibel unit used throughout this report is the same as that used in the 1954 report[2], and is defined as

$$db = 20 \log_{10} p$$

in which p is the sound pressure expressed in dynes per square centimeter. Most of the measurements reported can be considered accurate within 1 or 2 db, the amount of variation depending upon the magnitude and upon the extent of fluctuation of the sounds measured.

Water Flow-Noise in 1½-in. Straight Pipe

Fig. 1 shows the position of the microphone in each of the 2 lengths of 1½-in. pipe tested. The 2 total lengths were 9.78 ft and 27.04 ft. The additional 1-ft length shown was used only when testing orifices and other fittings, and not during the straight-pipe runs. The inlet and discharge lines connected to the test lengths contained suitable sound-damping arrangements to prevent transmission of control-valve noises into the test lengths.

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*Assistant Professor of Mechanical Engineering, Northwestern University.

[1] Exponent numerals refer to References.

For presentation at the 62nd Annual Meeting of the American Society of Heating and Air-Conditioning Engineers, Cincinnati, Ohio, January 1956.

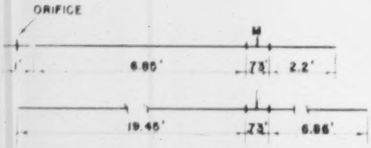

Fig. 1—Position of microphone in each of the test lengths of 1½-in. pipe. For tests of fittings, each fitting occupied the position labelled orifice

Fig. 2 shows the microphone mounting. Considerable care was used in selecting the unions and in minimizing changes in section inside them. Evident in the photograph is the thin rubber membrane used to cover the flat microphone face. A thin layer of silicone oil between the membrane and the microphone face insured the absence of trapped air which could affect the microphone readings.

Fig. 3 presents the experimental measurements determined for cold water (38 to 70 F) and for inlet pressure of 20 to 25 psig. Fig. 4 was derived from Fig. 3, and the curves were faired in to correspond to the general trends of the similar curves for 1-in. pipe presented in the earlier report[2]. The trends are correct, although there may be some error in the curves, as each was drawn through only 2 plotted points.

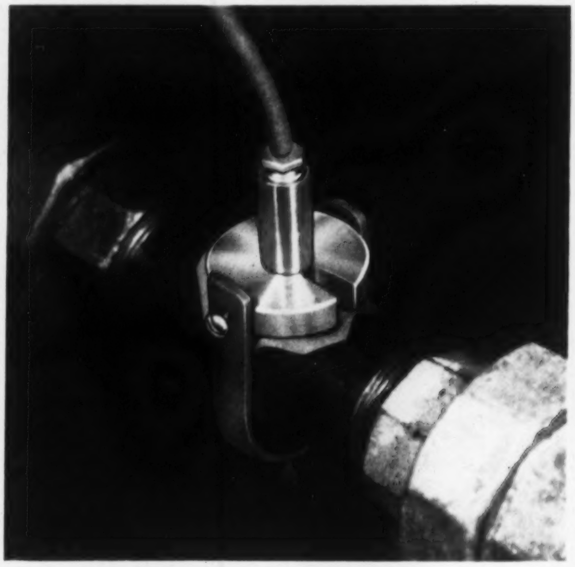

Fig. 2—Microphone mounting arrangement in 1½-in. pipe

Correlation of Straight-Pipe Flow-Noise Measurements

Fig. 5 presents the most satisfactory correlation of straight-pipe flow-noise data obtained to date. The sound pressure produced per square inch of pipe flow area is plotted as a function of pressure drop per foot of pipe due to flow. In other words, the intensity of noise production is a function of the intensity of pressure drop. The relationship appears to be approximately a linear one, when sound pressure in dynes per square centimeter (*not* in decibel units) is used as the ordinate. Only the longer lengths of 1-in. and 1½-in. pipes tested have been plotted. For the shorter lengths not plotted, considerably less than 100 pipe diameters were present before the microphone, and it is felt that possibly the full equilibrium turbulence pattern was not established in the water by the time the water reached the microphone location. Points for the shorter lengths fell below the curves of Fig. 5, lending credence to this thought. Also, the higher sound levels produced in the longer pipes were capable of more accurate measurement.

The pressure drops of Fig. 5 were *calculated*, using a plot of the Colebrook function† to determine friction factors. Reynolds numbers could be calculated accurately, but it was

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†Mechanical Engineers' Handbook, 5th Edition, by L. S. Marks, Editor-in-Chief. (McGraw-Hill Book Co., Inc., New York, N. Y.)

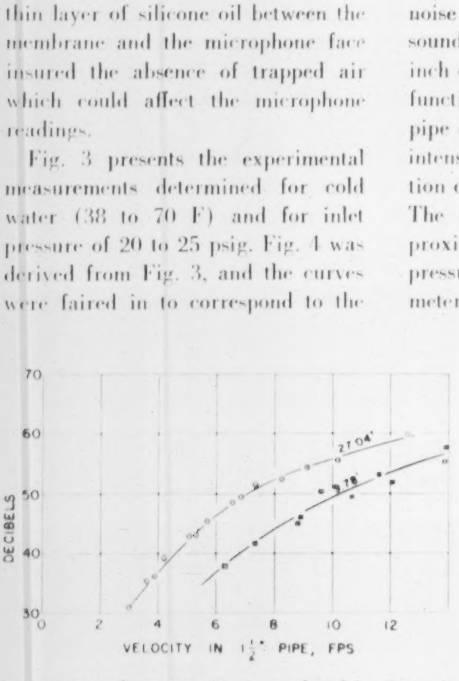

Fig. 3—Sound-pressure levels produced by flow of water through two lengths of 1½-in. straight pipe

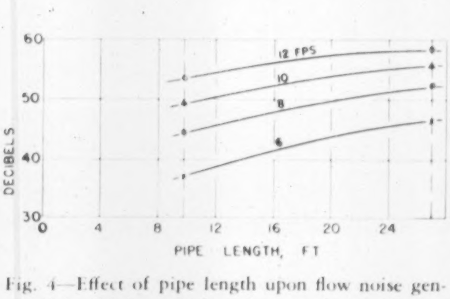

Fig. 4—Effect of pipe length upon flow noise generated in 1½-in. straight pipe at various velocities

necessary to assume values of pipe surface roughness before friction factors could be determined. Values given for new wrought iron and steel pipe were used, although pipes tested were not all new, and even the new pipes unquestionably changed somewhat before all tests were completed. The 2 lines drawn in Fig. 5, and the spread of the plotted points, may well reflect only the effects of the uncertainties concerning the relative roughnesses and friction factors. With this in mind, the correlation appears to be reasonably satisfactory.

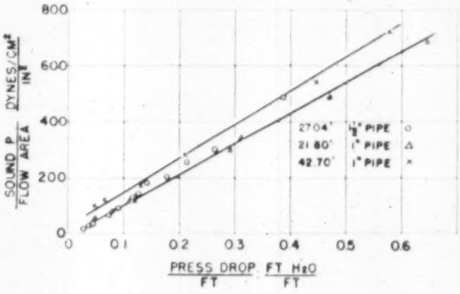

Fig. 5—Correlation of noises produced by flow of water through straight pipes

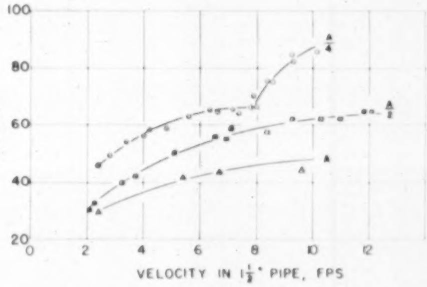

Fig. 6—Sound-pressure levels produced by flow through orifices

Actual pressure drops were not measured because of the possibility that pressure taps might contribute unwanted noise or otherwise affect the sound levels being measured.

In 1½-in. pipe, the predominant frequencies produced were similar to those previously determined in 1-in. pipe. The band from 20 to 75 cycles per second (cps) usually contained the major part of the total signal, with significant amounts lying also in the 75-150 cps band, and occasionally in the 150-300 cps band. Above 300 cps, there was negligible contribution to the total signal. Occasionally there were hints that selective amplification of certain of the frequencies present could occur by resonance in the piping circuit. For example, in some runs a note was heard in the monitoring earphones, and the same frequency could be reinforced by thumping a rubber hose used in the feed line. The contribution of the note to the total noise level was not large (although not negligible either) but the note was discernible. In general, however, the noises were broad-band in character, as they were also for 1-in. pipe.

In a series of check runs using 1-in. pipe, water temperature was varied over a range from 37 to 129 F. Use of the microphone at temperatures higher than this was not deemed advisable. The data showed a slight decrease in noise produced at the higher temperatures — a maximum reduction of approximately 2 db. Water velocities used in tests were 5 to 13 fps. The indications are that water temperature has only a small effect on flow-noise production in straight pipe as long as the water remains liquid. Conditions promoting cavitation during flow would be expected to promote intense noise generation simultaneously.

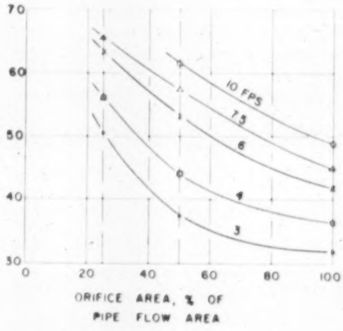

Fig. 7—Effect of orifice area upon noise generation for flow at various velocities in 1½-in. approach pipe

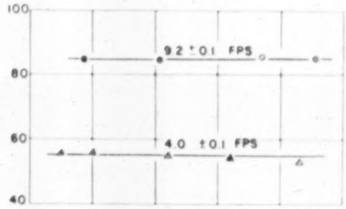

Fig. 8—Effect of water temperature upon flow-noise production of the A/4 orifice in 1½-in. pipe

Although only 2 pipe sizes have been investigated, there is little reason to expect that other sizes would behave differently. Noise produced by fittings has been found to be considerably more significant than that produced in straight pipe, and this observation could be expected to be true for sizes not tested, also. If this is accepted as true, and because as flow velocity is increased through straight pipe it must also necessarily be increased through the fittings of a system, it is concluded that noise produced by flow of liquid water through straight pipe must be assigned to a position of secondary importance most of the time. For very long, straight runs with few fittings or in pipes not flowing full, this conclusion might have to be modified.

Flow-Noise Through Orifices

Orifices in 1½-in. Pipe: Noise levels produced by flow of water through orifices having ¼ and ½ of the full flow area of 1½-in. pipe are shown in Fig. 6. The tests were made with cold water, with inlet pressure of 15 to 20 psig. The trends are the same as those found in 1-in. pipe. The abrupt increase in noise for the A/4 orifice is attributed to cavitation. At velocities higher than those of the test, the A/2 curve should exhibit the same characteristic.

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Fig. 7 is derived from Fig. 6 and illustrates the effect of orifice size on the production of noise at various flow velocities. Points involving cavitation are *not* included in this curve.

The trend of frequencies was the same as for 1-in. pipe — a rise in importance of the higher frequencies at the higher flow rates. At low flow rates (say 4 fps) frequencies of importance were mostly in the 150-600 cps range. After the onset of cavitation, frequencies of importance extended up to and beyond 2400 cps.

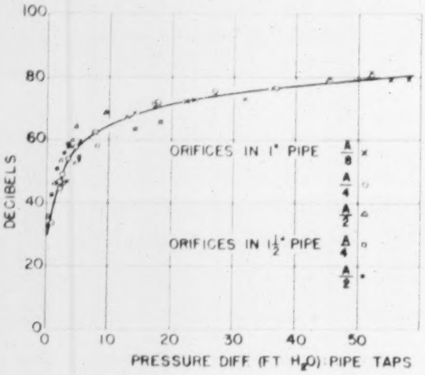

Fig. 9—Correlation of flow noises through orifices

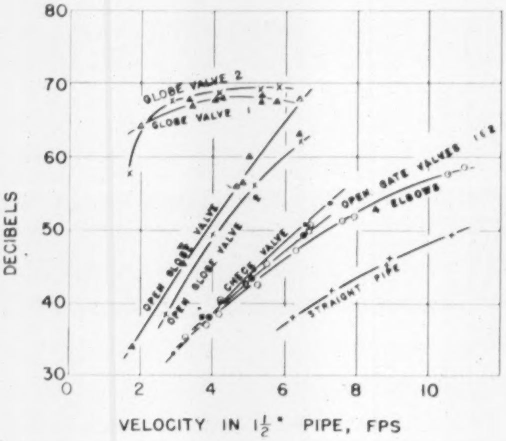

Fig. 10—Sound-pressure levels produced by flow through 1½-in. fittings

Effect of Temperature: Fig. 8 shows the results of tests made at 2 velocities for the A/4 orifice in 1½-in. pipe. Temperature of the water was varied between about 50 and 130 F. From Fig. 6 it can be seen that the run at the higher velocity (9.2 fps) occurred with conditions giving intense cavitation, while there was no cavitation at all in the lower-speed run (at 4.0 fps). In either instance, water temperature within the range of the tests had little effect on the production of noise. Without cavitation, there appears to be a slight tendency toward reduced noise at higher temperature, as was noted also for straight pipe. The change appears to be inconsequential, however (within the range of the tests).

In check runs in 1-in. pipe, water at 127-128 F was run through an A/8 orifice at various velocities, and the points fell on the same curve of db *vs.* velocity as the points for cold water runs. It appears that for *liquid* water, noise produced by flow through orifices is not particularly sensitive to water temperature. This was indicated to be true also for straight-pipe flow. In addition, after full cavitation is developed, the temperature again appears to exert an insignificant effect. However, the velocity at incipient cavitation (and the sudden noise increase) should be expected to be influenced by water temperature. At higher temperatures, cavitation should occur at lower velocities (at the same pressure).

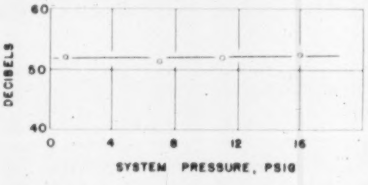

Fig. 11—Effect of system pressure upon pump noise produced in the water

Correlation of Flow—Noise Measurements: Fig. 9 was plotted in an attempt to relate sound pressure levels to abruptness of pressure change across orifices. All points represent runs made at velocities below those at which cavitation began. The pressure drop was *calculated*, not measured. It was considered inadvisable to use pressure taps because their effect on the noise production of the system was unknown. For the calculated pressure differences, flow coefficients for sharp-edged orifices were taken from the *ASME* publication *Fluid Meters*, Part I, 4th Edition, 1937. Experimental measurements gave the actual flow rate in each run and allowed the calculation of Reynolds number. In the tables for *pipe taps*, the flow coefficient *k* was listed as a function of Reynolds number and the ratio of diameter of orifice to diameter of pipe. With the flow coefficient and the actual flow rate known, the pressure drop for pipe taps was calculated from equation:

$$q = A_{orifice}\,(2\,gh)^{1/2}\,(k)$$

in which

q = cubic feet per second of actual flow.
h = pressure drop, feet of water.
k = flow coefficient.

Pipe tap locations, as indicated in the *Fluid Meters* publication, are at 1 or 2 pipe diameters upstream from the orifice, and at 4 to 8 pipe diameters downstream at or beyond the location of the maximum downstream static pressure. Values of *k* for 2-in. pipe were used because smaller pipe sizes are not listed. However, comparison of values given for 2, 3, 4, and 6-in. pipes indicate that the error involved should be very small.

The correlation indicated by Fig. 9 is not perfect, but it is evident that pressure drop is a significant factor. For any one orifice, all points lie reasonably well on one curve, and the curves for different orifices lie rather close together. When it is considered that the condition of the supposedly sharp edge of an orifice exerts a marked influence on the flow rate and pressure drop, and probably also on the production of noise, it is not inconceivable that the differences in the plotted points might reflect the relative sharpness or roundness of the orifice edges. With this thought in mind, the correlation may be much better than a first glance might indicate. The orifices tested were turned on a lathe with reasonable care, but there was no meticulous inspection of edge sharpness and no use of microscopic examination.

It is interesting to note that a plot of the average curve shown in Fig. 9 is approximately a straight line when the sound pressure is expressed in dynes per square centimeter. Thus, if the pressure drop is doubled, the sound pressure expressed in dynes per square centimeter (not in decibels) is approximately doubled also. This assumes no cavitation, which would cause a much greater increase. The same linear trend is evident when each orifice is plotted separately.

Flow Noise Through 1½-inch Valves and Elbows

Fig. 10 indicates the relative importance of several typical 1½-in. fittings as noise producers. The trends and orders of magnitude are essentially the same as those reported previously for 1-in. fittings. The highest noise levels are produced by the globe valves used to throttle the flow. Two samples were checked. Fully-open globe valves are considerably noisier than open gate valves. The 4 elbows were arranged in a U shape with 2-ft sides and bottom. They cause as much noise as a considerable length of straight pipe.

Preliminary Pump Tests

With a collection of information available on noises produced by flow of water through pipes and fittings, it was logical next to compare this information with the magnitudes of noise produced in the water by pumps. A typical 1-in. circulator of the type used in heating systems was selected for some preliminary experimentation. It was arranged to operate in a closed system, taking water from a supply tank, discharging it into the test section containing the microphone, from which the water returned to the tank. Suitable sound-damping arrangements preceded and followed the pump and microphone section. The system pressure and temperature could be regulated to desired values.

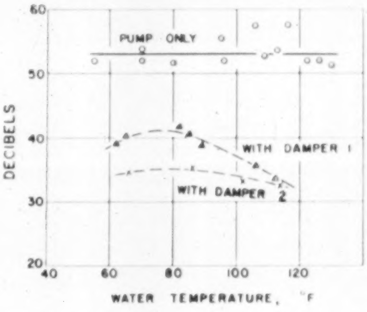

Fig. 12—Effect of water temperature on pump noise produced in the water, and the effectiveness of 2 experimental sound dampers in reducing liquid-path transmission of pump noise

In Fig. 11 are plotted the results of a run made at different levels of system pressure, this pressure being measured a short distance upstream from the pump. Flow velocity in the 1-in. pipe was 1.08 fps for all runs, a somewhat low value for the pump, produced by causing the pump to discharge against a relatively high pressure. Water temperature was 83 F. The order of magnitude of the noise was about the same as that of many of the fittings already discussed. System pressure did not affect the amount of noise generated.

A series of runs was made also at constant system pressure of about 12 psig (before the pump) and for a range of velocities from zero to about 6 fps. There was no large effect of velocity on sound produced, a total spread of about 2 db being found.

The top curve of Fig. 12 indicates that water temperature, too, had an inconsequential effect within the range tested (55 — 130 F).

Generalizations cannot be made from tests of one pump operated within limited ranges of variables. However, it can be stated that *flow* noises *in the water* obviously can be as large or larger than *pump* noises produced in the water. The pump, however, constitutes a greater noise hazard because its noise is concentrated at certain frequencies. Thus if a natural frequency of the liquid circuit or of the pipe structure and hanging arrangement coincides with one of the pump's predominant frequencies, there is available a great deal more input energy to excite vibration and noise than is available in the relatively broad-band noises produced by fittings, in general.

In addition to the noise generated in the water (and this is transferred rather readily to the pipe wall) the pump and motor can cause vibration of the pipe wall directly by contact. This vibration reaches the water in the pipe rather readily, too. The pipe wall and water inside are more closely coupled than if the pipe contained a gas. For mechanical isolation of the pump and motor vibrations from the pipe wall, the basic principles are almost self-evident: soft mountings and connections with natural frequencies low relative to disturbing frequencies. This aspect of the total problem has not received attention in the current study because it is felt that more is unknown about certain other aspects.

Sound Transmission Along the Water Path

At the conclusion of the pump tests, it was decided to evaluate an experimental sound damping chamber by placing it between the pump discharge and the microphone. The chamber consisted of a 12-in. length of 6-in. pipe packed full of small-

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bore glass tubes having outside diameter of 4 mm each and wall thickness of approximately 0.8 mm. The small tube size was expected to effectively damp pressure oscillations by viscous drag. The transitions from 1-in. pipe to 6-in. pipe were accomplished with standard fittings. At the pump-discharge end the transition was 21 in. long, and at the microphone end it was only 8 in. long. This damper is labelled No. 2 in Fig. 12, and it is obvious that it performed very satisfactorily.

Next it was decided that a sudden enlargement with no filling should be tried. From theoretical considerations, it was anticipated that such an enlargement should act as a low-pass filter, cutting off frequencies above a certain value. The exact effect on the cut-off frequency of variations in area ratio, volume, and other factors was not known. A chamber readily available had an inside diameter of 7¾ in. and a length of 17-½ in. This chamber was used, with results as indicated by the curve for damper No. 1 in Fig. 12. The results were encouraging, the sudden enlargement seemed to offer a simple and practical means of blocking transmission along the water path, and so it was decided to explore the variables involved.

The author knows of instances in which he has been convinced that transmission of noise along the water path has been at the heart of the trouble. In other instances, resonance within the liquid circuit seemed to be a possibility. In such circumstances, the use of sudden enlargements as filters should be capable of solving the problem and has solved it in some actual installations. Quantitative information for design purposes is needed, however.

Experimental Apparatus for Evaluating Damper Performance

It was decided to assemble a system containing a source of noise of controlled frequencies and amplitudes which could be fed into the liquid water in a pipe. Fig. 13 shows the system which was evolved after considerable experimentation. The vertical feature allows the 1-in. pipe to be filled from the bottom with a minimum tendency to trap air, which caused considerable trouble in earlier horizontal runs. The pressure in the system can be reproduced readily, and also the length of water column.

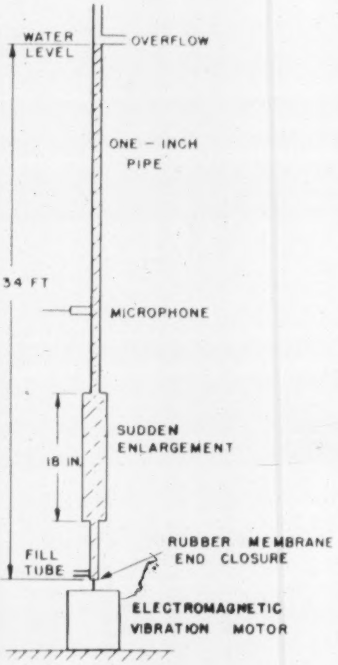

Fig. 13—Experimental arrangement for evaluating liquid-path sound dampers or filters

The bottom of the pipe is covered with a rubber membrane fastened with a hose clamp. At the center of the membrane a small circular flat plate serves as a piston. Attached to this plate is a bolt which also is attached to the vibration motor. Vertical oscillations of the armature of the vibration motor thus produce vertical piston motion and corresponding pressure pulsations in the water.

In all runs, the exciter coil of the vibration motor was supplied with the same constant d-c voltage, and the armature (moving coil) with the same constant amperage.

Experimental Data — Three Damper Sizes

The system of Fig. 13 is open at the top, and so it was expected that the fundamental natural frequency of vertical wave travel in the water in the pipe would correspond to that for which the length of water column is a half wavelength. The frequency would be, then, the speed of sound in the pipe divided by 2(6.34). The speed of sound in a pipe is reduced by the expansion of the pipe walls, which cannot be assumed to be perfectly rigid when a pipe contains water. The effect can be calculated. Ganitta's equation (which was used also in Reference 3) gives the ratio of the speed of sound c in a pipe to the speed c_o in free water as

$$\frac{c}{c_o} = \left[\frac{1}{1 + \dfrac{2\rho c_o^2 d}{g\left(1 - \dfrac{5a}{6d}\right) aE}} \right]^{\frac{1}{2}}$$

in which

ρ = water density.
g = gravitational constant.
d = inside pipe diameter.
a = pipe wall thickness.
E = Young's modulus of pipe material.

For standard 1-in. pipe, $c/c_o = 1.09$. Using a value of 4,794 fps for c_o, $c = 4{,}390$ fps. Therefore, the calculated fundamental resonant frequency for wave travel in the water column of Fig. 13 is 4,390/12.68, or 346 cps.

Experimentally, the resonant frequency was found to be 343 cps, as indicated by the peak of the top curve of Fig. 14. The data for this top curve were obtained with 1-in. pipe used in place of the sudden enlargement shown in Fig. 13. The resonant peak below 100 cps is attributed, at the moment and pending fuller investigation, to *structural* resonance of the pipe. Draining the water caused a marked drop in microphone output although to the ear the sound level remained unchanged. That there is much poorer transfer of pipe-wall vibration to gas than to liquid is a known fact, and so there appears to be substantiation for the assumption of structural resonance.

The characteristics of 3 sizes of sudden enlargements used as sound dampers are shown in Fig. 14. The 3 standard pipe sizes all had lengths of 18 in. The change in section was sudden, produced by tapping flat end plates for 1-in. pipe. The end-plates were welded to the pipes.

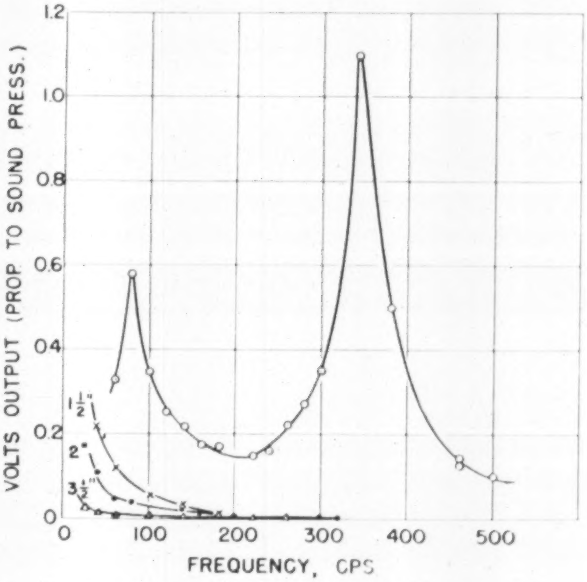

Fig. 14—Effectiveness and characteristics of 3 sizes of sudden enlargements in 1-in. pipe as acoustic low-pass filters

It is apparent that the enlargements are effective, and that the larger sizes become effective at lower frequencies. This is the anticipated characteristic of low-pass filter action. It seems, further, that the required sizes of enlargements are not prohibitively large, and that they offer a practical means of minimizing sound transmission along the water path when this is a problem. The data of Fig. 14 also support the proposition that resonance within the water column of a piping system can intensify or create a noise problem which might be of little consequence in the absence of the resonant condition, and that a sudden enlargement can cure such a problem. Although Fig. 14 extends only to 600 cps, the actual tests were run to 2600 cps. With straight pipe, higher harmonics were excited, but with the filters in use, there was no microphone signal beyond those plotted in the figure.

The quantitative evaluation of the factors of importance to the filter action is continuing. The data of Fig. 14 indicate the feasibility of the filters, but a more complete quantitative report must wait upon additional testing. The volume of the enlargement is expected to be of considerable importance, theoretical considerations indicating that the larger the volume, the lower the cut-off frequency.

Other logical future activity should include consideration of high-pass filters as well as the low-pass type. Depending upon the situation, one type might be preferable to the other. A study of the phenomenon of resonance in the water path of a closed piping system containing a source of noise should also be capable of contributing to understanding of the ways in which a noise problem can appear in a practical system.

Acknowledgment

The author wishes to express appreciation to Messrs. Duclos, Grenleski, Grounds, Huellmantel, and Ross, all Graduate Assistants at Northwestern University. Each of these men assisted in some measure in the activity of this project during the past year. The continuing cooperation of Prof. B. H. Jennings is also acknowledged.

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AT THE SEMI-ANNUAL MEETING

The President's Page

The Value of Membership

WE ARE now starting another new Society year and this is my last opportunity to write to you as President.

I believe that the past year has been a most successful one because of the many valuable contributions by our members. Society and chapter committees and joint committees with other societies have met frequently during the year and the value of membership has very definitely increased as the Society moves forward in the advancement of the arts and sciences of heating, ventilating, cooling and air conditioning.

We now have more than 10,000 members and it has been estimated by the Membership Committee that there are at least 100,000 additional people in the United States and Canada who are qualified to become members of our Society, and thus to contribute to the advancement of our aims and purposes.

It is a privilege to be a member of our Society and we receive a return for our membership only as the result of the contributions which we are able to make.

We want well-qualified members who will take an active part in Society activities and when this is done there are certain to be many benefits received.

It is interesting that as our membership has increased from about 3800 to more than 10,000 during the past 10 years, the percentage of full Members has also shown a steady increase. This is very encouraging.

But just what is the true value of membership? It cannot be measured in dollars readily but it can be measured in the self-satisfaction of having made a contribution to a profession which is growing so rapidly, and to the general public who are the users of this industry's products and services.

The heating and air-conditioning industry is more than three times as large as it was 10 years ago and it will undoubtedly be more than three times as large by 1965.

One important thing that must be done is to attract more young and capable engineers to the heating and air conditioning field in order to provide the research and engineering which is so necessary. Has air conditioning lost the glamour that it had 15 years ago and if so what should be done about it? The Society's public relations program is intended to prevent or correct this situation if it exists.

The Membership Committee has recently revised the Membership Committee Section of the Manual for Chapter Operations so as to assist these committees in obtaining new qualified members. This is very important because we need the support of more qualified people to accomplish those things which may become overwhelming unless we realize what must be done, if we are to progress in this rapidly growing field and if we are to continue in a role of realistic leadership.

It has been a distinct pleasure to serve as your President during the past year. I hope that I may have made some small contribution to the continued advancement of the Society and the industry and that each of you is as optimistic about the future of the Society and the industry as I am.

John E. Haines
President

AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS

Self-Actuated Room Control from High-Speed Air

By Edwin F. Snyder, Jr.*, Minneapolis, Minn.

SUMMARY — This paper presents the design background, testing, and certain performance results of a temperature control system using the energy contained in the controlled medium to actuate the system. The principles used are not new. The paper discusses only control of the occupied space and does not cover the problems of coil and fan control.

The method holds a reasonably constant air flow while the duct pressures vary; it varies the mixing ratio of hot and cold air; and it is self-powered. Data are included on the noise levels developed and the attenuation effectiveness of mufflers.

The cost of individual space control with high velocity air-handling systems is rather high due to the number of units normally involved in this type of system. It is desirable to reduce this cost as much as possible by reducing the amount of electric wiring or pneumatic piping required if this can be done without sacrificing control.

High-velocity air is a source of readily available energy. A static pressure of 1 in. water column (WC) is equivalent to 0.03609 lb per sq in. or 0.23 lb per sq ft. When operating with a 6-in. static pressure there is available a pressure of 31.38 lb per sq ft. Presence of this large amount of energy in the flowing air suggests that it be made the basis of accomplishing this desirable goal of cost reduction.

Apparatus and Instrumentation

The test work involved in the evaluation of this system included two general phases. The first covered the performance of the controls and air valve while the second phase was devoted to the evaluation of the noise levels of the system.

The equipment used for the control performance tests consisted of: two draft gages (0-10.0 in. water), one draft gage (0-0.50 in. water), one draft gage (0-0.25 in. water), a $3\frac{1}{2}$ in. calibrated orifice, a high pressure blower and duct system, a dial indicator (0.0005 in.), and a pitot-static tube.

The noise evaluating tests made use of the following facilities and equipment: one sound control room, one high pressure blower and duct system, one sound-level meter (Type 1551A), one octave-band analyzer (Type 1550A), a set of calibration equipment, and a Rochelle-salt crystal microphone.

In order to properly evaluate the sound level of the equipment being tested, it was necessary to have a space in which background and extraneous noises were held to a minimum. For this purpose, a sound test room was constructed and all laboratory tests were conducted in this room.

Procedure

The control of a high-pressure air-handling system must consider three basic factors, *viz:* (a) air temperature, (b) air velocity; and (c) noise.

A fourth factor might be considered, namely static pressure, but since this is so directly related to air velocity, it is not included in the list.

All high velocity air-handling systems can be divided into two basic types; namely the single-duct and the dual-duct. In the single-duct system, the amount of heating or cooling accomplished in the controlled space can be varied by varying the temperature of a fixed volume of air or by varying the volume of air held at a fixed temperature or by a combination of these two methods. The dual-duct system normally utilizes one duct for carrying chilled air and the other duct for carrying heated air. The two ducts terminate in a mixing box where the air is combined in the proper proportions to meet the requirements of the confined space.

Since the dual-duct system appears to be the more complex from a control point of view, this is the system that was used as the design target. The considerations outlined in the introduction to this paper and an analysis of the characteristics of the dual-duct high pressure system indicated that a self-actuated control system would be practical.

Preliminary design work provided a type of air valve such as that shown in Fig. 1. The material for the flexible diaphragm was a critical item

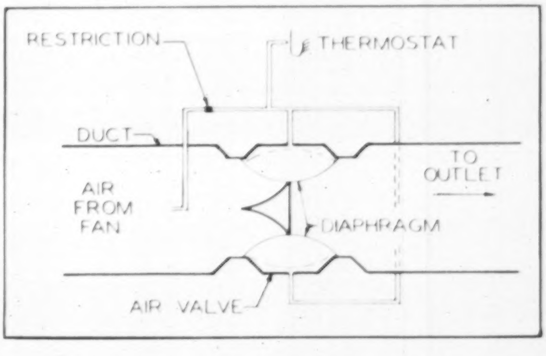

Fig. 1—Schematic of valve type resulting from preliminary design work

since it must be highly flexible under all operating conditions of temperature, must have a high fatigue level, must resist abrasion and must not deteriorate over a long period of time. Such a material was found and operating models were built on the order of the unit shown in Fig. 1.

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*Supervisor, Control Application Commercial Division, Minneapolis-Honeywell Regulator Co. Member of ASHAE.

For presentation at the 62nd Annual Meeting of the American Society of Heating and Air-Conditioning Engineers, Cincinnati, Ohio, January 1956.

The unit makes up one control system and the operation is as follows: The flexible diaphragms each form one side of an air chamber whose other side is rigid. The chamber is tapped for an air connection which is, in turn, connected through a tee-connection to a bleed-type room thermostat and then terminates in a pressure pick-up head upstream of the air valve. A restriction is placed in the air line between the pressure pick-up head and the thermostat.

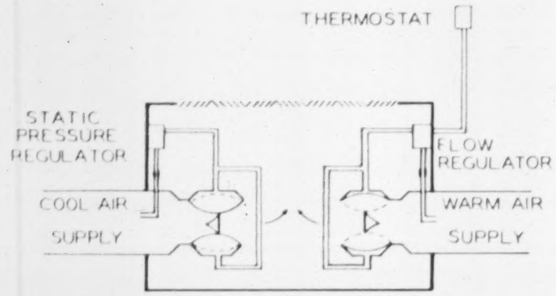


Fig. 2—Schematic air valve for use with dual-duct system when ducts terminate in a mixing chamber

Referring again to Fig. 1, it is seen that the pressure pick-up head is exposed to duct pressures on the upstream side of the air valve. This is the point of highest pressure in the segment of the system shown. There is a pressure drop across the air valve due to the resistance of the valve and the thermostat is mounted in the controlled space where the pressure is atmospheric.

Assuming that the duct shown in Fig. 1 is carrying heated air, then as the space temperature rises, the bi-metal thermostatic element moves against the nozzle and closes it. The air entering the pick-up head under the pressure at that point is transmitted to the air valves. Since the pressure upstream from the valve is higher than at the valve, this causes the flexible diaphragms to move out against the center stops and thus, closes the duct. As the space temperature falls, the bi-metallic sensing element moves away from the thermostat nozzle and air is allowed to bleed out through the nozzle. Since the restriction is between the pick-up head and the thermostat, air can be bled faster through the thermostat nozzle than it can be supplied through the restriction and the flexible diaphragm collapses. If the nozzle is wide open, the diaphragm assumes the approximate position shown by the dotted line at the air valve. If the nozzle is not opened wide, the diaphragm assumes an intermediate position as determined by the pressure balance, and proportioning action results.

Fig. 2 shows schematically a dual-duct unit where the ducts terminate in a mixing chamber. In this case, one duct carries chilled air and one heated air. Investigation shows that the warm air duct is controlled in the same manner as the system in Fig. 1. The only difference lies in the fact that a flow regulator has been added. The flow regulator acts very much like a relay and increases the effective capacity of the system thus reducing the system response time.

It will be noted that there is no inter-connection of controls between the warm air and cold air ducts. Installations of this dual-duct type normally require a constant volume of air delivered to the space and that pre-supposes a constant static pressure within the mixing chamber. Thus, if there is an increased call for heat so that the warm air duct opens there must be a corresponding drop in cold air supplied to the mixing chamber or the discharge volume cannot be held constant. The system shown indicates a static pressure regulator controlling the air valve on the cold air duct. As the static pressure within the mixing chamber varies due to a repositioning of the warm air valve by the thermostat, the static pressure regulator varies the flow through the cold air valve so that the static pressure within the mixing chamber remains relatively constant.

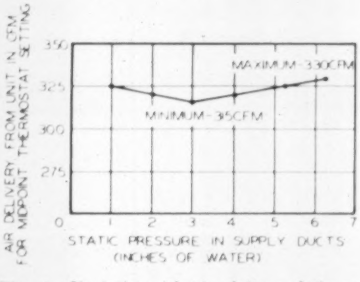


Fig. 3—Variation of air delivered from dual-duct mixing chamber with supply duct pressure changes (test results with control calibrated for 325 cfm delivery)

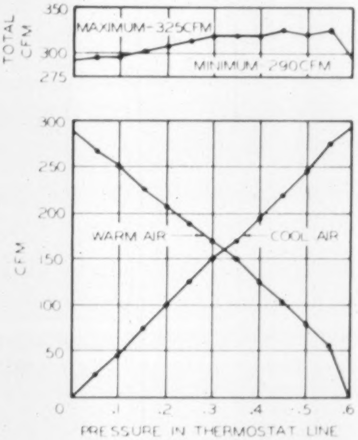


Fig. 4—Test results like Fig. 3 but with control calibrated for 290 cfm delivery

Fig. 3 shows the air delivery from a dual-duct system and mixing chamber where the control system was calibrated for a delivery of 325 cfm from the mixing chamber. It will be noted that the delivery from the mixing chamber varied from 315 cfm to 330 cfm as the static pressure in the supply ducts varied from 1 in. water to 6.25 in. water.

Fig. 4 shows the results of another test run on the same system but with the control system calibrated for a 290 cfm delivery from the mixing chamber. The curve at the top of the figure shows the total air delivery as the demand goes from all heating to all cooling.

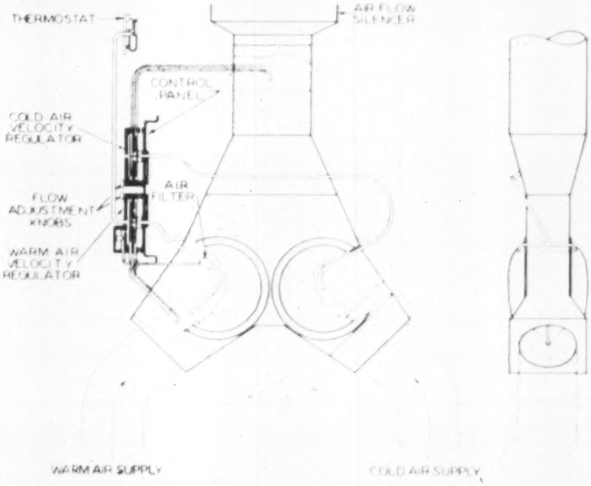


Fig. 5—Schematic showing a means of using separate air valves at "Y"-connection for combining dual-duct air streams

The curves on the bottom of Fig. 4 show the deliveries from the cold air and hot air ducts as the demand changes from 100 percent heating to 100 percent cooling. It will be noted that, due to the relay action of the flow regulator, the pressures in the thermostat line are considerably less than in the supply ducts.

Fig. 5 shows a means by which both air ducts with their separate valves can be combined in a single "Y"-type unit. The figure shows an air flow silencer or sound attenuator added to the outlet of the "Y"-type unit. A unit of this general type is suitable for use with ceiling type outlets where other mixing chambers are not necessarily available.

The "Y"-type unit was installed on an actual job in the field. Performance test results are shown in Fig. 6.

The Noise Problem and the Sound Evaluation Methods

An extremely critical factor in any high pressure air handling system of this sort is the noise level of the system. Since controls of the type discussed here are an integral part of the complete system, it is essential that their noise level be such that it will not increase the overall effect to too great an amount. Space permits only a few brief remarks concerning noise and its measurement.

Noise, briefly, is any undesirable sound. This sound was measured by a sound level meter which measures sounds of essentially three different types: *i.e.*, it has 2 filter weighted networks (A and B scale) to approximate human ear response and it has a flat response (C scale) which is also used to measure actual sound pressure levels. Proper application of the instrument permits measurement of sound pressure level which can be used to determine the actual acoustic properties of a sound source.

Frequencies of the sound components were studied with the assistance of the octave band analyzer — an instrument which allows the insertion of various filter networks into the measuring system so as to cause the exclusion of all but one particular band of frequencies. The scale of frequencies runs in 8 octaves from 37.5 to 9600 cycles per second (cps). Although the scale on the analyzer and the scale often discussed in theory is 2-75 cps in the first band and 4800-10 Kc in the last band, the actual response of the instrument and a more exact consideration of the term octave band gives the range of frequencies stated.

In analyzing a noise source, the particular frequency (in this case a band of frequencies one octave wide) causing the noise as well as its sound pressure level in relation to the other frequencies becomes very important. This fact is due mainly to the frequency response characteristics of the human ear. Not only do different frequencies affect a given ear in a particular manner, but people also differ in response in connection with various noises under various conditions. This is, of course, the complicating factor with which any noise evaluation technique must be concerned.

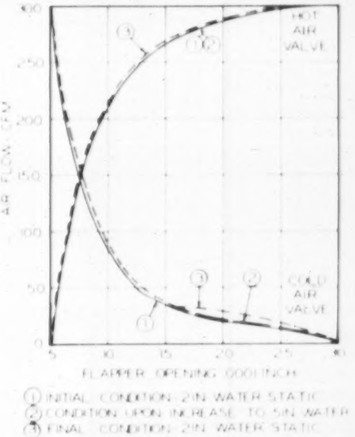


Fig. 6—Field test results with valves installed by method sketched in Fig. 5

Although several methods of noise evaluation have been developed, the method used in the sound test laboratory is that proposed by Armour Research Foundation. This method begins, as in all methods, with the sound pressure level in each octave band. The band pressure level is then plotted on a chart developed especially for the purpose of evaluating noise characteristics. The plotted points are then connected by a smooth curve for convenience and the loudness of each band is read on the sone scale appearing on the chart. Addition of the band loudness through the 8 octaves gives the total loudness of the device under test.

In the case of a grill or opening discharging air, it can be said that the sound source is directional and that the sound being radiated represents a random frequency spectrum.

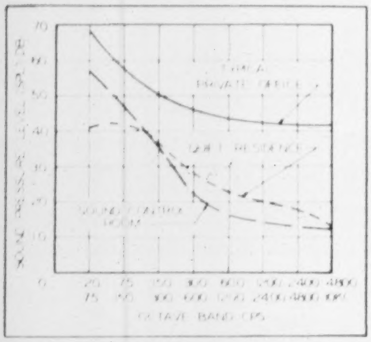


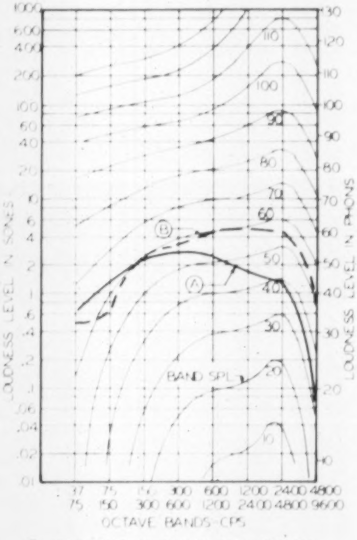
Fig. 7—Sound pressure level at center of sound control room and sound levels found in a private office and a quiet residence

However, the source can be treated somewhat more simply by neglecting, for the moment, its directional characteristics. Further, since in this case the unit was to be measured in an enclosure (the sound control room) certain conditions had to be established. The essential consideration is that the microphone should not be placed in the area of a standing wave where the walls of the enclosure are causing a considerable increase in sound pressure due mainly to reverberation in the room. The problem can be simplified further by establishing a test code which provides microphone positions based on comparative results rather than absolute acoustic properties. Ambient sound characteristics had to be established and this was done by using current methods and with due regard to recommended corrections such as those of the *American Standards Association (ASA)* which require that there be at least 2 db difference between the ambient level and the level observed with the test device in operation. Table 1 represents corrections to be applied when the difference is less than 10 db.

The sound measurement test room used is essentially an enclosure capable of providing the required ambient sound level and having the necessary accessories to deliver a known quantity of air to the device under test. Construction is designed to attenuate the sound level of the surrounding area in general, and to reduce as much as possible the structural vibrations present. The inner room which is the essential element of the whole system, consists of a room floating on isolation pads with walls, floor and ceiling of masonry material. All entries for air control and electricity are of a flexible nature to increase the isolation characteristics. The inner surfaces of the control room are lined with a highly absorbent material 3 in. thick. The air supply into the control room is metered through either of the 2 supply ducts, according to *ASME* flow measurement procedures, with a 5-in. sharp-edged orifice in an 8-in. duct. The ambient characteristics of the control room are as follows: The sound level ranges from 25 to 30 db measured according to the method previously described; the sound pressure level at the speech interference level is 12 to 17 db; and the loudness level is approximately 1.5 sones over the full frequency spectrum. The range of sound level or sound pressure level is due mainly to a low frequency rumble present in the structural system and will be high or low depending on what particular equipment is operating in the basement of the test laboratory. These ambient characteristics permit noise measurements to be made on a majority of the devices which would be normally considered as noise generators. Fig. 7 indicates the relative sound pressure level of various specified locations, one of which is the approximate geometric center of the sound control room.

Noise Evaluation of "Y"-Type Duct Control Unit

Now then, to proceed with the noise evaluation of the "Y"-type duct.



(A) LOUDNESS AT 1IN. STATIC AND 300 CFM
(B) LOUDNESS AT 6IN. STATIC AND 300 CFM

Fig. 8—Loudness evaluation using "Y"-type mixing unit

The first phase of the investigation was to determine the loudest condition of air delivery; *i.e.* (*a*) the loudness, in sones, at 1 in. static and 300 cfm total flow and (*b*) the loudness at 6 in. static and the same total flow. In order to provide data which might later be used on a comparative basis, it was decided that the test code of the *Industrial Unit Heater Association* be followed with regard to microphone location. The unit under test was installed in the center of the sound control room with a horizontal, upward, discharge 3 ft from the floor. This location allowed measurements to be made in the near field of the source. Fig. 8 represents an evaluation of the data wherein the total loudness for condition (*a*) is found to be 12.3 sones and the loudness for condition (*b*) is found to be 21.5 sones. It is well to mention here that during the testing it was found that the total flow from the device which

Table 1—Correction for Ambient Sound Level

Difference in db between ambient sound level and sound level with device under test operating (total sound level)	2	3	4	6	8	10
Correction to be applied to total sound level, decibel	4.3	3.0	2.2	1.3	0.8	0.4

is stated to be 300 cfm might possibly be in error due to ductwork leaks between the flow meters and the "Y"-type unit. However, this defect in test procedure will have little effect on a relative basis.

The second phase was to determine which frequency band made the greatest contribution to the overall loudness of the device. Also, since this particular octave band varies with static pressure, to compare the results of condition (*a*) and (*b*). Condition (*a*) has its greatest portion of loudness in the 300 to 600 cps band and condition (*b*) was loudest in the 1200 to 2400 cps band. This information is found on Fig. 8.

Sound tests were conducted on the same "Y"-type unit with a sound muffler or attenuator attached.

The "Y"-type valve together with the muffler was installed in the sound control room at an angle of about 45 deg to the floor. The location and angle were chosen so as to provide the maximum amount of distance between the discharge of the muffler and the test enclosure. A search of the sound pressure level in a plane through the nozzle or discharge opening of the muffler at a 1-ft radius revealed that the spread of pressure was less than 2 db.

The mike was placed at the position of greatest sound pressure level found in the discharge plane. A similar search in the plane through the opening of the "Y"-type valve at a distance of 1-ft from the edge of the opening revealed that no position was greater than other positions by more than 4 db. The mike was also placed in the position of greatest sound pressure level when measuring the sound being produced by the "Y"-type valve. Investigation revealed that these positions were not located in a standing wave and they were approximately into the diffuse field.

Table 2 is a summary of the observed data and also lists the actual band level attenuation obtained by the addition of the muffler.

Reference to Table 2 will reveal the 37.5-75 cps band has not been reported. This is due to the fact that there is not enough difference between the sound pressure level air delivery and the ambient sound pressure level. This elimination of the low band pressure level affects the noise rating of the device. However, the magnitude of this effect can be neglected in this case since the low band pressure level without the muffler contributed approximately 1 sone to the noise rating while the contribution with the muffler was probably less than 1 sone. It is well to mention that the ambient level was measured with no air being delivered to the device under test. Comparing the noise input to the muffler with the noise output it is found that the muffler reduced the noise by 87 percent.

An actual installation of the "Y"-type units and the individual units, such as shown in Fig. 2 was made in an office and both air delivery and noise performance checks were made. The results of the flow tests were very nearly the same as those obtained in the laboratory tests. The noise tests gave an equally satisfactory result.

CONCLUSIONS

The performance tests conducted in the laboratory and reported herewith demonstrate that it is possible to design an air mixing unit to be used on high velocity (high pressure) air distribution systems that will:

1. Deliver a reasonably constant total air flow while the duct pressures vary between 1 in. water and 6.25 in. water.

2. Vary the mixing ratio of hot and cold air supply through a range of 0 percent to 100 percent respectively.

3. Use the available air duct pressure to actuate the automatic control device for temperature and air flow control.

The laboratory tests also provide information on the noise levels developed and the attenuation effectiveness of the mufflers used with the air mixing mechanism.

Acknowledgment

The author would like to acknowledge with sincere thanks the contribution made to the sections dealing with noise by S. O. Gullicksen of the Minneapolis-Honeywell Regulator Co.

Table 2—Summary of Observed Data Showing Actual Band Level Attenuation Obtained by Addition of the Muffler

Band, cps	SPL Without Muffler, db	SPL With Muffler, db	Attenuation, db	
			Desired	Actual
75-150	75	62	[illegible]	13
150-300	76	57	10	19
300-600	73	45	22	28
600-1200	67	34	30	33
1200-2400	65	31	34	34
2400-4800	58	28	34	30
4800-9600	51	16	32	35
Noise Rating	44.5 sone	5.8 sone		

What's New About Heating Load?

By Paul R. Achenbach*, Washington, D. C.

COMPUTATION of the heating load is at the core of the profession of the heating engineer. The principles are as old as the ASHAE itself. It is interesting to note that the procedure for calculating heat losses in THE GUIDE 1955 is only slightly more detailed than that in the 4th edition of THE GUIDE published in 1925-26. The wording of some of the procedural steps is identical in the two volumes. The question can logically be asked: Is there anything new to be done with such an old problem?

The answer to this question is an unqualified, Yes. Recent advances in mathematical analysis of the simultaneous heat transfer in all elements of a complete building, in correlation of large masses of weather data by automatic computers, and in the application of tracer gas methods to air leakage problems, promise to improve heating load computations more in the next decade than in the past several decades. The ASHAE is active in all of these fields of research.

Improved Data Needed

There has been a steady improvement in the data available on outdoor design temperatures, heat transmission coefficients for structural components and glass, heat flow through various floor and foundation constructions, and interior temperature distribution, but there are still unsolved problems that cause heat loss calculations to be less precise than desirable. The principal parts of the heating load computation now preventing greater precision being attained are as follows: (a) variable outdoor temperature, wind velocity, and insolation (b) inadequate knowledge on air infiltration (c) inadequate data on the heat transfer through floors in contact with the earth and with air spaces beneath them, and (d) insufficient data on attic temperatures.

Heat Load Studies by Circuits and Analogues

For simplicity the heat loss of a building has traditionally been treated as a problem in steady-state heat flow, but this is almost never the case, on either a short-term or long-term basis. Actually, the proper selection of outdoor design temperatures is an analytical problem of considerable magnitude, and heat capacity of a structure has a bearing on its maximum instantaneous heat loss.

Thermal circuit analysis is being used to evaluate transient heat flow through the many parallel paths in the exterior shell of a building under the influence of changing outdoor temperature, wind velocity, sunshine, air leakage, and other factors so the effect of the heat capacity of a structure as well as the conductivity of its components can be accounted for in determining the maximum heat loss from the interior. Analogue techniques are being used effectively to study heat conduction in concrete floors and complicated foundation elements in contact with the earth so floor heat losses or heat gains can be more accurately known.

Better Weather Data

Large masses of weather data are being correlated by automatic computing machines based on probability theory to permit selection of outdoor design temperatures for all areas of the country that provide equal risk of being exceeded. Further analysis of weather data may yield information on the frequency and duration of cold periods of a given severity so the design temperature can be better correlated with the heat capacity of the structure.

Tracer Gas for Infiltration

Tracer gas techniques and apparatus are now available which measure accurately the fresh air leakage into a structure from outside. This apparatus can be used to investigate air leakage in basements, attics, cavity walls, and living spaces and to measure the quantities of air exchanged between such spaces. When the paths of air movement in the various types of building construction have been charted, better precision can be attained in its control and more accurate estimates of air infiltration can be made.

All of these new approaches to old problems stir fresh interest in making heating load calculations more exact, thereby securing important gains in comfort and economy for the owners and users of heated buildings.

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*Chairman, ASHAE Technical Advisory Committee on Heating Load.

RESISTANCE OF RECTANGULAR DIVIDED-FLOW FITTINGS

By L. G. Miller[*], C. H. Pesterfield[**], East Lansing, and R. J. Waalkes[†], Holland, Mich.

This paper is the result of research sponsored by the American Society of Heating and Air-Conditioning Engineers, Inc., in cooperation with the Department of Mechanical Engineering, Michigan State University, East Lansing, Mich.

The take-off is one of the most common fittings of an air-duct system, being second in importance only to the elbow. In spite of this, there have been relatively few systematic investigations of the pressure loss in take-offs[‡], and leading reference books contain little information on the subject. The purpose of this research project was to fill one of the gaps in our knowledge, and to determine the pressure loss in typical rectangular fittings designed to accomplish divided air streams.

Fittings of this type are used to divide the air stream in a main into two branches, one continuing straight and the other at a right angle to the main, with both branches varying in cross section. To properly connect the two branches, engineers have variously shaped the take-off branch, guided undoubtedly by the desire to accomplish the division of the air stream with as little resistance as possible. Some designs use a complete elbow in fitting the branch to the main, others attempt to split the main in a proper place, and still others aim at velocity control by influencing the expansion or contraction of the air stream.

In spite of the multiplicity of possible designs, an analysis indicates that take-off fittings may be divided into three general classifications, which are designated in this paper as (1) increaser section with 90-deg elbow, (2) straight section with special elbow, and (3) decreaser section with 45-deg elbow, with each class sub-divided into three groups with (*a*) large straight duct and small take-off, (*b*) straight and take-off ducts of equal size, and (*c*) small straight duct and large take-off duct.

SUMMARY — A laboratory investigation of the pressure losses of divided-flow fittings common to "trunk-duct" systems is reported. Three different fitting designs were tested, each with three different sizes of branch ducts.

Pressure losses of the straight-through section were found to be negligible for four of the fittings tested. However, in two, the loss was appreciable.

Test results for the 90-deg branch sections agreed well with a qualitative analysis based on principles of fluid dynamics, as well as with published data on other types.

Results are presented in a form directly usable by application engineers.

Consequently, this investigation has dealt with 9 different take-off fittings, each representing one of the classes and sub-divisions. The size of the main section of each of the fittings of the three classes was 20 × 8 in., with three fittings having 18 × 8 in. straight duct and 3 × 8 in. take-off duct representing sub-division (*a*), three fittings having 10½ × 8 in. straight duct and 10½ × 8 in. take-off duct representing sub-division (*b*), and three fittings having 3 × 8 in. straight duct and 18 × 8 in. take-off duct representing sub-division (*c*). As Fig. 1 shows, Class 1 of the fittings (increaser type) expands the approaching air stream to include the sum of the branch widths and employs a full 90-deg elbow with a reasonable throat radius for the take-off duct. Class 2 (straight type) uses the principle of dividing the stream at the appropriate point by means of special shape of splitter, and Class 3 (decreaser type) substitutes a 45-deg angle elbow for the customary 90-deg elbow in an attempt to transform the approach velocity in the main to that of the two branches.

From a study of the problem it appeared that the pressure loss in the take-off fitting would be dependent upon several factors; namely, the design of the fittings, the respective sizes of the *take-off* and *reduced straight* branches, the total quantity of air being handled through the fittings and the quantity of air being handled by each branch. These four factors, therefore, become the variables in the test program.

After a reasonable number of test runs had been made, it was found that the performance of Class 3 (decreaser type) fittings was too erratic to be properly evaluated. Therefore, the present report covers only data for fittings of Class 1 (increaser section 1, 2 and 3) and Class 2 (straight section 4, 5 and 6).

Test Equipment and Calibration

The test equipment consisted of a centrifugal blower connected to a system of ductwork, with quadrant damper, bell-shaped measuring orifice, static taps, and orifices located as shown in Fig. 2.

To keep the duct system from becoming cumbersome and at the same time provide a means for measuring the flow, the resistances in each branch were varied by providing a series of rectangular sharp-edged orifices for each branch. The ducts were provided with U-shaped channels on three sides and a slot on the fourth side to permit the orifice plates to be changed externally without disturbing the ductwork.

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[*] Dean Emeritus of Engineering, Michigan State University, Member of ASHAE.

[**] Professor of Mechanical Engineering, Michigan State University, Member of ASHAE.

[†] Engineer, Hart & Cooley Manufacturing Co., Member of ASHAE.

[‡] Three ASHAE papers by other investigators dealing with pressure losses in take-offs have been published since the start of this project (References 1, 2, 3).

For presentation at the 62nd Annual Meeting of the American Society of Heating and Air-Conditioning Engineers, Cincinnati, Ohio, January 1956.

Control of the total quantity of air being handled by the system was obtained by means of the damper located between the blower discharge and the main measuring orifice. The damper varied this quantity from about 1750 cfm in the full open position to about 200 cfm in the closed position. For flow quantities of less than 200 cfm it was necessary to restrict the blower suction opening.

The velocity pressure at the main measuring orifice was measured by means of 8½ in. (for low readings) inclined draft gages in conjunction with an impact tube and static tap. The static pressures at the tap in the duct just before the takeoff fitting and the taps in the two branches beyond the fitting were read on similar 3, 1½ in. gages. All gages were calibrated in inches of water.

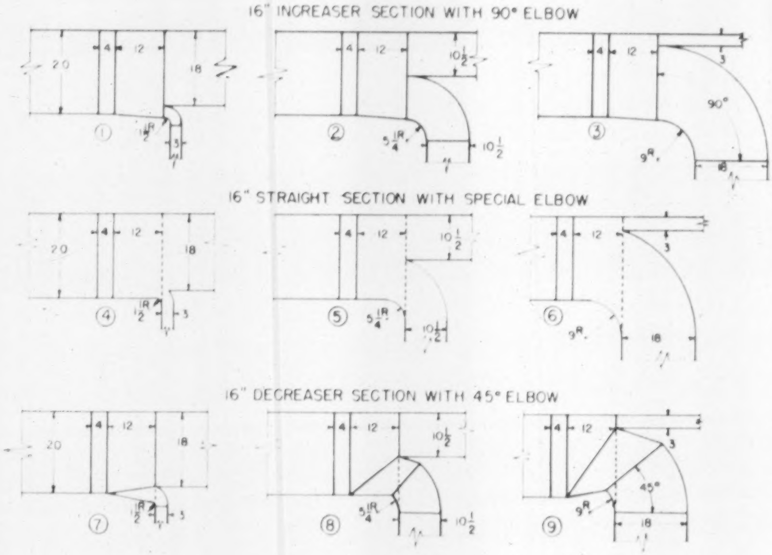
16" INCREASER SECTION WITH 90° ELBOW
16" STRAIGHT SECTION WITH SPECIAL ELBOW
16" DECREASER SECTION WITH 45° ELBOW
①
②
③
④
⑤
⑥
⑦
⑧
⑨
90°
45°

Fig. 1—Details of Fittings Tested

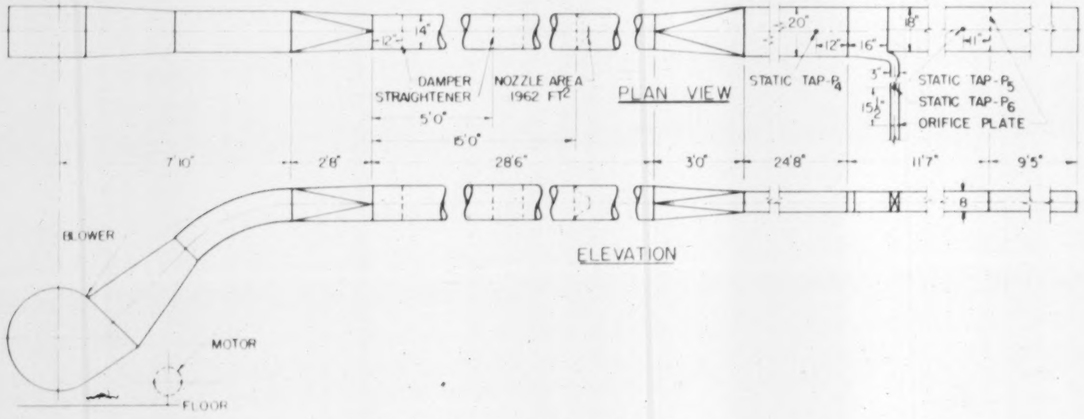

Fig. 2—Details of Testing Equipment

All of the joints beyond the main measuring station (including longitudinal Pittsburgh lock seams) were soldered. The fittings were provided with gasketed flange joints to eliminate leakage and permit interchanging, and the previously mentioned U-shaped channels were tightly soldered to the duct to prevent leakage around the edges of the orifice plates. Thereafter, every time a new fitting was put in place, a check was made to determine the extent of the leakage by closing both branches with blanks in place of the sharp-edged orifices. If any appreciable leakage was detected, it was corrected before proceeding with the test.

The sharp-edged orifices in the branches were calibrated by blanking off one of them and causing all of the air to go through the other. The quantity flowing was varied by means of the damper, and the flow rate determined by calculation from the velocity pressure reading at the main measuring orifice. This value was then plotted against the static pressure reading at the tap near the sharp-edged orifice to establish the calibration curve for the orifice.

Test Procedure

In performing the test work, the outline of the variables previously indicated was followed. A particular style fitting was selected with one of the three combinations of branch duct sizes. A series of runs was then made on the fitting, the variable between runs being the combination of orifice sizes in the branches. The variable on each individual run then was the total volume of air flowing which ranged from maximum flow (depending on combination of orifice sizes with damper wide open) down to about 200 cfm. Since there were four different orifices for each of the $10\frac{1}{2} \times 8$ in. ducts, the possible combinations made a total of 16 runs for the $10\frac{1}{2} \times 8$ in. by $10\frac{1}{2} \times 8$ in. fittings.

For each run, measurements were made of the velocity pressure at the main measuring orifice; the static pressure in the main duct upstream from the fitting; the static pressure in the reduced straight duct beyond the fitting; and the static pressure in the take-off duct beyond the fitting.

In the actual taking of the data, the velocity pressures greater than 0.5 were read on the 8 in. inclined draft gage and those less than 0.5 in. were read on the ½ in. inclined draft gage after a steady state was reached following the damper adjustment. The static pressures P_4, P_5, and P_6 were read on a 3, 1 or ½ in. gage as required, with the three static taps being connected to a common point through a ground glass stopcock for each line. This arrangement permitted the reading of all three pressures on the same instrument.

Compilation of Data

From the test data, calculations were made of the total pressure change from a point in the main duct upstream of the fitting to a point in the branch ducts downstream of the fitting. The friction loss due to the actual length between measuring stations (as obtained from the ASHAE Friction Chart) was then subtracted to determine the loss due to the fitting alone. The results were expressed dimensionlessly as decimal fractions of the velocity pressure corresponding to the mean velocities of flow in both branch and main ducts.

The detailed procedure was as follows:

1. From observed velocity pressure and area of main measuring orifice calculate total quantity of air flowing Q_4.

2. From total quantity of air flowing and area of main duct at static tap P_4 calculate velocity pressure at plane of tap.

3. By addition of calculated velocity pressure and observed static pressure obtain total pressure at static tap P_4.

4. From observed static pressure P_5 and calibration curve determine cubic feet per minute through reduced straight duct Q_5.

5. From Q_5 and area of duct at tap P_5 calculate the velocity pressure at plane of tap.

6. By addition of calculated velocity pressure and observed static pressure P_5 obtain total pressure at plane of tap P_5.

7, 8, 9. By steps similar to 4, 5 and 6 obtain total pressure at plane of tap P_6.

10. By subtraction of the friction loss between P_4 and the fitting determine the total pressure at the upstream side of the fitting. By addition to P_5 and P_6 of the equivalent resistances of the duct on the downstream part of the fitting, determine the total pressure at the downstream side of the fitting.

11. By subtraction of the total pressures at the upstream and downstream points of the fitting, obtain pressure loss due to the fitting.

12. Divide this loss by the velocity pressure at a characteristic cross section, thereby expressing it as a decimal fraction of the velocity pressure. These values are defined in the accompanying tabulation of values of loss coefficients (Table 1).

13. Previous investigations[1] have shown that pressure losses of divided-flow fittings can be correlated with the ratio of branch and main velocities. Hence, the final step was to plot λ_B and ${}_T\lambda_B$ against V_6/V_4 (See Fig. 5) and to plot λ_S and ${}_T\lambda_S$ against V_5/V_4. Curves were then faired through the points and subjected to analysis.

Table 1—Values of Loss Coefficients

$$\lambda_B = \frac{\text{Total Pressure Loss (90 deg branch to main)}}{\text{Velocity Pressure in 90° branch}}$$

$$_T\lambda_B = \frac{\text{Total Pressure Loss (90 deg branch to main)}}{\text{Velocity Pressure in Upstream Main}}$$

$$\lambda_S = \frac{\text{Total Pressure Loss (straight branch to main)}}{\text{Velocity Pressure in Straight Branch}}$$

$$_T\lambda_S = \frac{\text{Total Pressure Loss (straight branch to main)}}{\text{Velocity Pressure in Upstream Main}}$$

Actually, a modification of steps 5 and 8 was necessary since the values of Q_5 and Q_6 as obtained in steps 4 and 7 did not sum to precisely Q_4 (step 1). It was felt that this was due to inability to read the gages accurately to three places, and that since the orifice were calibrated against the main orifices in the first place, it would be most consistent to use Q_4 value as being correct. Therefore, the values of Q_5 and Q_6 from the calibration curves were added, and Q_6 divided by the total to obtain the percent diverted in the take-off. This percentage of the correct total cubic feet per minute, Q_4, then was a corrected quantity of flow through the take-off Q_{6c}, and by subtraction, $Q_4 - Q_{6c}$, a corrected value of the quantity flowing in the reduced straight duct was obtained Q_{5c}. These two values then were used in steps 5 and 8, and the calculations carried to completion.

The initial plots showed considerable scatter. Detailed analysis indicated the scatter could be reduced considerably by 1) discarding all readings less than 0.010 in. of water; and 2) determining a single, most representative value of pressure loss from the eleven variable cfm runs made with each configuration of the apparatus. The latter was accomplished by fairing a curve through plots of fitting loss *vs* air-flow rate.

Results and Discussion

In discarding test data having such small pressure differences that the results would be sensitive to slight inaccuracies in measurement, practically all of the data for the straight branches of Fittings 1, 2, 4 and 5 were eliminated. In accordance with conventional laboratory practice[3], the pressure readings were taken downstream of each fitting and corrected back to the junction so as to express the test results on a *no length* basis. Hence, the pressure loss was that caused by disturbances as the flow divided at the junction. Referring to Fittings 1 and 4 in Fig. 1, the 90-deg branch is so small that even though the velocities in the 90-deg branch were varied over a wide range, the maximum flow rate diverted into it was small compared

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[1] Exponent numerals refer to References.

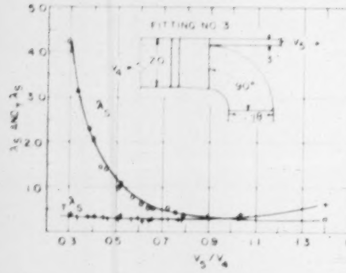

Fig. 3—Pressure Loss in Terms of Velocity Pressures for Straight Branch of Fitting 3

with the total flow rate in the upstream main. The cfm variation in the 18 in. wide straight branch, and hence the variation in velocity, was therefore small. Thus, very little acceleration or retardation of the straight branch flow occurred and, as a consequence, little loss due to flow separation and attendant eddies. The practical significance is that the junction losses of the four straight branches were negligible.

Similar reasoning applies to the straight branches of Fittings 2 and 5; *i.e.*, their pressure losses were also essentially zero.

Discarding of data for these four branches does not detract from the value of the tests. From a design standpoint, the tests show that the additional pressure loss due to flow disturbances in the straight-through sections of these fittings can be ignored in the design process.

Results for the straight branches of Fittings 3 and 6 are presented in Figs. 3 and 4, respectively. Two curves are shown in each figure; the λ_S curve represents the pressure loss as referred to the straight branch velocity pressure and the $_T\lambda_S$ curve represents the same loss with the velocity pressure in the upstream main as reference. Since the branch and upstream main velocities are the same at $V_6/V_4 = 1.0$, the curves necessarily have the same value at this condition. Comparing the two figures it is seen that corresponding curves are nearly identical. This is to be anticipated since Fig. 1 shows Fittings 3 and 6 were nearly identical in construction. The principal difference in geometry is that the center of the 90-deg branch radius of Fitting 6 is upstream of the straight branch junction. Apparently any difference in flow disturbances at the

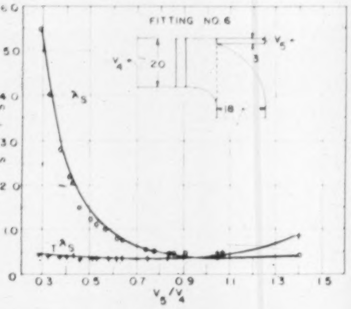

Fig. 4—Pressure Loss in Terms of Velocity Pressures for Straight Branch of Fitting 6

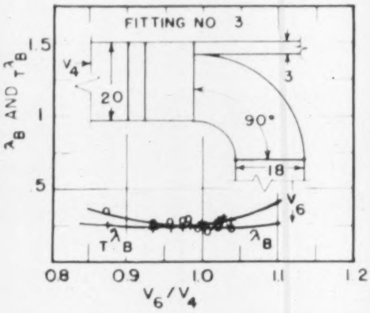

Fig. 5—Pressure Loss in Terms of Velocity Pressures for 90-deg Branch of Fitting 3

inner wall of the 90-deg branches were not propagated across the 18-in. width of duct, or if they were the effects were too small to be of practical significance.

Results for the 90-deg branches of Fittings 3 and 6 are presented in Figs. 5 and 6, respectively. The range of velocity ratio variation is narrow. The maximum is limited to a value of 1.1 as a result of the large area of the branch with respect to the main. The range below $V_6/V_4 = 0.85$ was eliminated because of extremely low pressure differences. Over the range of the data, the corresponding Figs. 5 and 6 curves are nearly identical because of nearly similar geometries. Since at a velocity ratio of unity the branch flow is neither accelerated nor retarded, a minimum might be expected there. This is indicated by the results in Fig. 5. Also, acceleration of a flow is an inherently efficient process, so that for some geometries the minimum in the λ_B curves might occur at velocity ratios above unity. This possibility is indicated by the λ_B curve of Fig. 6. Since deceleration of the flow is an inherently inefficient process, the occurrence of a minimum value at a velocity ratio less than unity should NOT be anticipated.

At $V_6/V_4 = 1.0$, the 90-deg branch performance should be equivalent to that of an elbow, with perhaps some slight additional pressure loss due to disturbances caused by the straight branch flow. For $V_6/V_4 = 1$, a representative value for both fittings is $\lambda_B = 0.25$. Elbow loss data from the literature[4] yields $\lambda_B = 0.28$. This good agreement validates to some extent the accuracy of the experimental data.

Results for the 90-deg branches of Fittings 2 and 5 are presented in Figs.

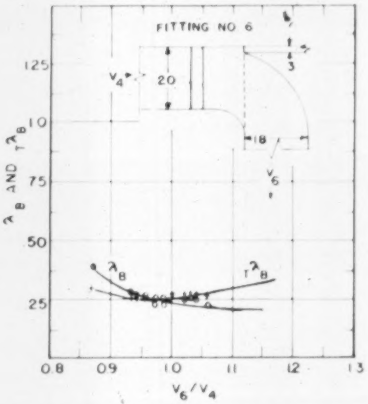

Fig. 6—Pressure Loss in Terms of Velocity Pressures for 90-deg Branch of Fitting 6

7 and 8, respectively. The reduction in branch width from 18 to 10.5 in. yields a wider variation in velocity ratio. The λ_B curve of Fitting 2 has a minimum close to $V_6/V_4 = 1.0$

and the Fitting 5 curve at $V_6/V_4 > 1.0$. As discussed, minimums at these velocity ratios are rational. The 16-in. increaser section of Fitting 2 evidently aids the deceleration of the flow because the performance of this fitting is better (lower λ_B values) at $V_6/V_4 < 1$. At $V_6/V_4 > 1$ the performance of Fitting 5 is better, indicating the positioning of the fitting radius further upstream is helpful to an accelerating flow.

This same relative performance should also be expected for Fittings 1 and 4, and comparison of the λ_B curves of Figs. 9 and 10 shows it is indeed the case. Comparison can be made directly in Fig. 11, in which it should also be noted that minimums occur at velocity ratios equal or above unity. Curve C has been obtained from a recent paper[3] and applies to cylindrical 90-deg branch takeoffs connected to main ducts of constant cross sectional area. Since Curve C is restricted to small branch-to-main area ratios, it can only be compared with the Fitting 1 and 4 results. Note the similarity in the shapes of the curves and that the λ_B values for the fittings are one-third to one-half of the Curve C values at the same velocity ratio. Thus, Fig. 11 shows Fittings 1 and 4 are considerably more effective in diverting the flow into the 90-deg branch. However, their effectiveness is obtained at the sacrifice of fabrication and installation costs. Moreover, at velocity ratios considerably above unity, Curves A and B will eventually rise and cross Curve C. The conclusion is therefore that the geometries of Fittings 1 and 4 are more favorable (with respect to pressure loss only) for low velocity ratios, and the geometry of the cylindrical type of divided-flow Fitting 3 is more favorable for high velocity ratio applications.

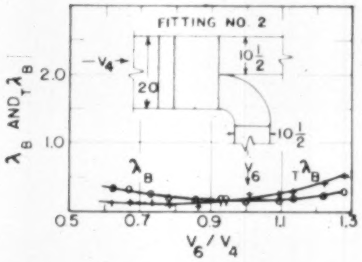

Fig. 7—Pressure Loss in Terms of Velocity Pressures for 90-deg Branch of Fitting 2

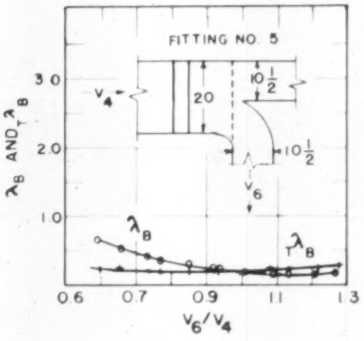

Fig. 8—Pressure Loss in Terms of Velocity Pressures for 90-deg Branch of Fitting 5

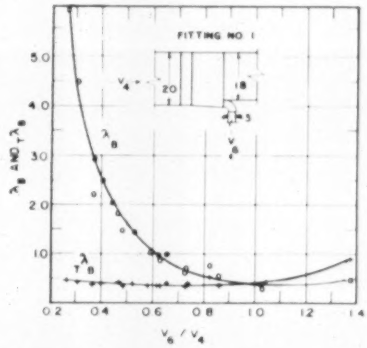

Fig. 9—Pressure Loss in Terms of Velocity Pressures for 90-deg Branch of Fitting 1

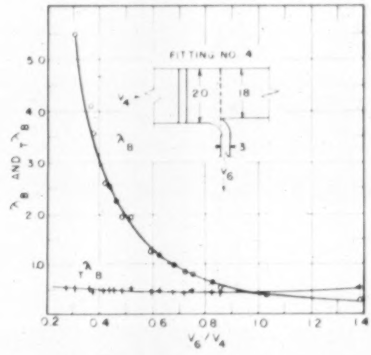

Fig. 10—Pressure Loss in Terms of Velocity Pressures for 90-deg Branch of Fitting 4

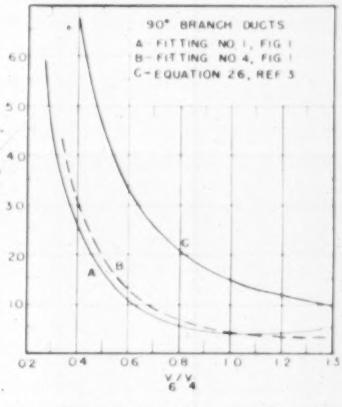

Fig. 11—Comparison of test results with those available for cylindrical, butt-type takeoff

The fittings of Fig. 1 are ordinarily used in so-called *Trunk Duct Systems*[5]. In these systems the 90-deg branch velocity is usually below the upstream main velocity. The practical range of the data presented is therefore in the region of velocity ratios less than 1.0. Inspection of the ${}_T\lambda_B$ and ${}_T\lambda_S$ curves of Figs. 3 to 10 discloses they are nearly horizontal in this region. As a consequence, for all practical purposes, the pressure loss can be expressed as a certain fraction of the velocity pressure in the *upstream main*. If this is done, the results are also easily expressed in *equivalent diameter of upstream main* if a value of friction factor f is assumed. The pressure loss of the straight branch is, in inches of water,

$$H = {}_T\lambda_S \; (V_T/4005)^2 \; \ldots\ldots\ldots\ldots (1)$$

where V_T is the mean velocity in the upstream main. Since the pressure loss in a straight pipe is

$$H = f \; (L/D) \; (V_T/4005)^2 \; \ldots\ldots (2)$$

Equating these, there is obtained:

$$L/D = {}_T\lambda_S/f \; \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

For the 90-deg branches, ${}_T\lambda_S$ in Equation 3 is replaced by ${}_T\lambda_B$. Based on these equations, design data for the usual range of velocity ratios are presented in Table 2.

If the designer prefers to use the loss in terms of the *branch* velocity pressure, the appropriate λ_B or λ_S curve can be used directly. Alternatively, $_T\lambda_S$ in equation 3 can be replaced by λ_B or λ_S to obtain the pressure loss in *equivalent diameters of branch duct*. It should be noted, however, that the equivalent diameter of *branch duct* is not a constant but varies markedly with velocity ratio.

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3. Pressure Losses of Divided-Flow Fittings, by S. F. Gilman (ASHAE Journal Section, *Heating, Piping & Air Conditioning*, April, 1955, p. 141).

4. *Fan Engineering*, R. D. Madison, Editor (published by Buffalo Forge Co., Buffalo, 5th Ed., Part 1, Sec. 3).

5. Heating, Ventilating, Air Conditioning Guide 1955 (published by the American Society of Heating and Air-Conditioning Engineers, New York, Chapter 20).

Table 2—Design Data For Fittings When Branch-to-Main Velocity Ratio is Less Than 1.0

Fitting No.	Branch	Loss In Upstream Main Velocity Heads	L/D, Equivalent Diameter of Upstream Main Duct*
1	Straight	0	0
1	90°	0.40	20
2	Straight	0	0
2	90°	0.16	8
3	Straight	0.30	15
3	90°	0.26	13
4	Straight	0	0
4	90°	0.44	22
5	Straight	0	0
5	90°	0.20	10
6	Straight	0.36	18
6	90°	0.26	13

*Based on a friction factor *f* of 0.02.

CONCLUSIONS

1. Performance of the fitting termed the *decreaser section with 45-deg angle* was erratic; test data for this type were therefore discarded.

2. Pressure losses at the junction of the straight branches were negligible for branch-to-main area ratios above 0.5.

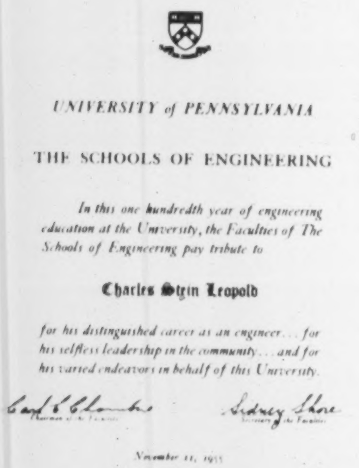
3. The *increaser section with 90-deg elbow* was more effective than the *straight section with special elbow* at velocity ratios less than about 1.0, and less effective at higher velocity ratios.

4. At velocity ratios of unity, the test results were in reasonable agreement with published elbow loss data.

5. The 90-deg branch losses were only one-third to one-half of those reported for cylindrical butt-type takeoffs, which is to be expected for the range of velocity ratios in which the tests were conducted.

6. Over the practical range of velocity ratio for the type of fitting tested, the pressure loss can be expressed as a certain fraction of the velocity pressure in the *upstream main* or, to a good approximation, by a single value of equivalent diameters of *upstream main duct*.

TWO PROMINENT ASHAE MEMBERS HONORED BY U. OF PENNSYLVANIA



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THE SCHOOLS OF ENGINEERING

In this one hundredth year of engineering education at the University, the Faculties of The Schools of Engineering pay tribute to

Charles Stein Leopold

for his distinguished career as an engineer . . . for his selfless leadership in the community . . . and for his varied endeavors in behalf of this University.

Carl C. Chambers — Chairman of the Faculties
Sidney Shore — Secretary of the Faculties

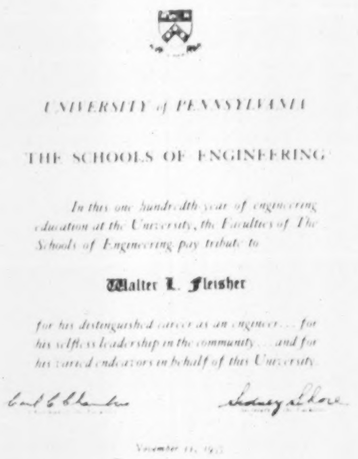
November 11, 1955

W. L. Fleisher of New York and C. S. Leopold of Philadelphia, well known members of the Society, were honored by the University of Pennsylvania last month during the commemoration of the 100th anniversary of The Schools of Engineering of the University.

Mr. Fleisher is a past president of the Society, and both he and Mr. Leopold are recipients of the F. Paul Anderson Medal.

The University cited Mr. Fleisher for his *pioneering work in the field of comfort air conditioning, for significant contributions to the technology of heating, ventilating, air conditioning and refrigeration, for active interest in engineering education, and for distinguished public service.*

The recognition of Mr. Leopold's accomplishments included his "notable achievements in the design of air conditioning systems for eminent public buildings, for distinguished leadership in the engineering profession, and for active participation in civic affairs."



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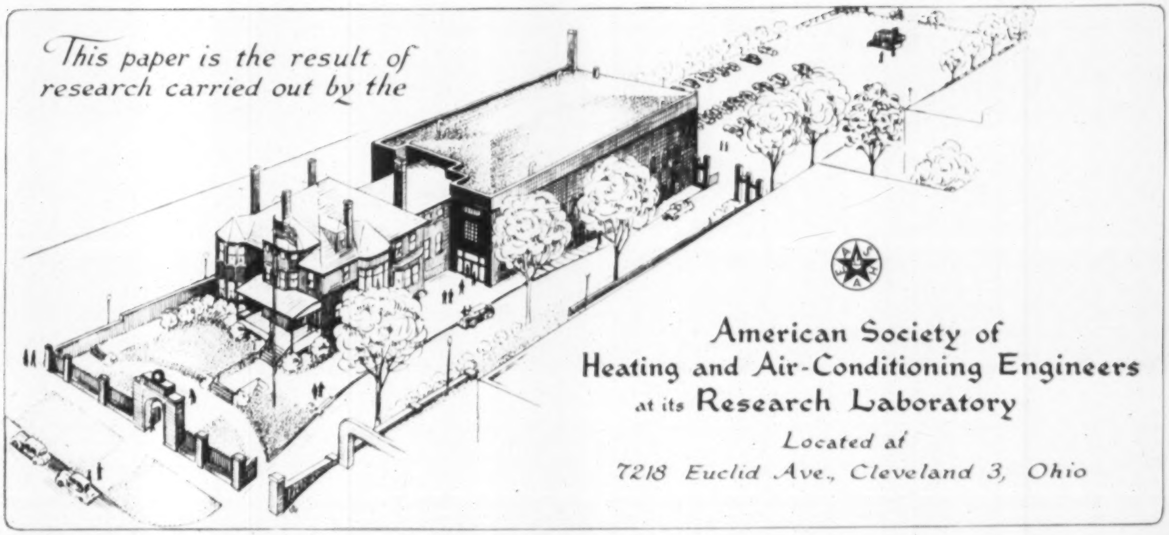
This paper is the result of
research carried out by the
American Society of
Heating and Air-Conditioning Engineers
at its Research Laboratory
Located at
7218 Euclid Ave., Cleveland 3, Ohio

Heat Gain Through Glass Skylight Fenestrations

By D. J. Vild* and G. V. Parmelee**, Cleveland, Ohio

SUMMARY — Essential data are presented for predicting the heat-flow performance for 2 glass-block skylights, 3 sheet-glass skylights, and 2 skylights consisting of a louvered light-control device over a sheet of glass. The instantaneous cooling load can be found for any combination of sun position, skylight orientation, and outdoor air temperature. Included is a comparison of total transmitted solar energy for each fenestration for a design day.

INCREASING USE of skylights in industrial and school buildings, and to some extent in residences, has developed a need for data on heat gain through this type of fenestration. A wide variety of fenestrations are in use, including sheet glass, sheet glass combined with some form of light control device, glass block, reinforced plastic sheet (usually corrugated), and plastic domes of various types. Skylights are particularly suited to large-area single story buildings in that they provide natural illumination to interior zones which cannot be reached by light from side-wall fenestrations. Early in 1954 a comprehensive program was formulated by the Technical Advisory Committee on Heat Flow through Glass[□] to develop the heat flow data needed by air-conditioning design engineers and architects. This program constitutes an extension of previous investigations which have been carried on at the Research Laboratory.

Proper skylighting requires an optimum combination of heat exclusion, light transmittance, and light distribution. This condition should exist in a room during as much of the period of occupancy as possible. It is desirable that the light entering the enclosure be evenly distributed and at a practical intensity level.

The results reported here are for 4 types of light-controlling skylights and 3 sheet-glass skylights.

Test Apparatus

The equipment used was the ASHAE solar calorimeter, previously described[1] in detail. Basically the calorimeter is as shown in Fig. 1. The calorimeter surface is made of sheet aluminum to which are welded aluminum tubes. A glycol-water solution is circulated through these tubes and, by means of an electronic temperature controller, is maintained at a constant inlet temperature, in most cases about 75 F. The total heat gain was found from the flow rate and the difference between entering and leaving temperatures of the coolant. Corrections for heat leakage through the back of the calorimeter and the edges of the fenestration were found by direct measurements and calibration.

It is possible to rotate and tilt the calorimeter to simulate any desired position of the sun. This makes it unnecessary to wait until a particular time of day to obtain a required solar altitude and azimuth.

Weather Conditions

Weather conditions affecting the thermal behavior of the skylight were recorded. Diffuse and total solar radiation were measured by 2 multi-junction Eppley pyrheliometers mounted adjacent to the skylight. At

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*Research Engineer, ASHAE Research Laboratory, Junior Member of ASHAE.

**Senior Research Supervisor, ASHAE Research Laboratory, Member of ASHAE.

□Personnel: R. A. Miller, *chairman;* N. B. Hutcheon, *vice chairman:* W. J. Arner, E. W. Conover, R. B. Crepps, D. D'Eustachio, W. B. Ewing, J. E. Frazier, J. S. Herbert, R. W. McKinley, E. C. Miles, F. W. Mowrey, J. P. Stewart, H. B. Vincent, O. F. Wenzler, C. J. Youngblood, Jr.

For presentation at the 62nd Annual Meeting of the AMERICAN SOCIETY OF HEATING AND AIR CONDITIONING ENGINEERS, Cincinnati, Ohio, January 1956.

[1] Exponent numerals refer to References.

regular intervals they were checked against each other. Low-temperature radiation was obtained by means of a convection-compensated radiometer developed at the Laboratory. Air temperature was measured by both an aspirated thermocouple and an aspirated psychrometer. The latter also yielded the air wet-bulb temperature. Wind velocity was determined with an integrating cup-type anemometer and wind direction by a wind vane. Cloudiness and other sky conditions were noted.

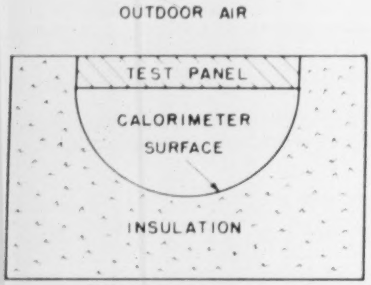


Fig. 1—Schematic Diagram of Solar Calorimeter

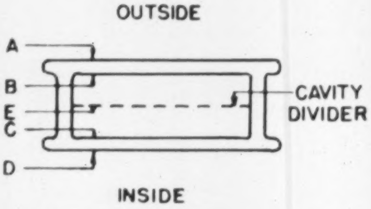
Outputs of thermocouples and pyrheliometers were read at regular intervals on an electronic self-balancing potentiometer. In addition, values most subject to fluctuation, such as the solar radiation and the temperature differential between the inlet and outlet coolant, were recorded on a high-speed recording potentiometer and were averaged.

Test Panels

During this program tests were conducted on 4 light-controlling fenestrations designed for use as skylights. Each panel measured approximately 4 ft sq and all but the diffusing-type block panel had the characteristic of requiring a particular orientation for proper performance. Hence, each of the panels, with the one exception, had an end designated as the *south* end. Brief descriptions of these skylights follow.

The thermal performance of sheet glass used as skylight fenestrations was studied experimentally in earlier research, and the test setup and data on solar energy transmittance have been previously reported[2].

Prism-Type Glass-Block Panel: This panel consisted of 16 blocks measuring $10\frac{5}{8} \times 10\frac{5}{8} \times 3\ 1/16$-in. It was prefabricated with the blocks supported on 12-in. centers by a grid of aluminum T-sections. An insulating cement was used as a filler between the blocks. The surface area of the panel was 78 percent glass block, the remainder being either aluminum or sealing mortar which covered the cement. Light control was by means of light-directing prisms on the lower side of the upper face and a light-diffusing fiber glass cavity divider (see Fig. 2).



Glass Block Patterns

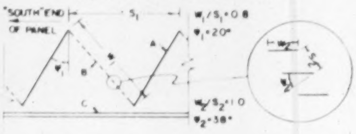
Prism Type

A. Smooth surface
B. Light-directing prisms
C. Light-diffusing surface
D. Light-diffusing surface
E. Clear fiber glass screen

Diffusing Type

A. Smooth surface
B. Stippled surface
C. Stippled surface
D. Narrow-ribbed surface
E. Green-tinted fiber glass screen

Compound Louvered Device



A. Diffuse reflecting aluminum
B. Specular aluminum sunscreen
C. Flat glass sheet

Flat Glass Sheets

Glass No.	*Description*
1	Regular plate glass
11	Hammered heat absorbing glass
12	Hammered and etched heat absorbing glass
21	Hammered and etched flint glass

Fig. 2—Description of Glass Blocks, Compound Louvered Device, and Sheet Glasses

Diffusing-Type Glass-Block Panel: Nine $11\frac{3}{4} \times 11\frac{3}{4} \times 3\frac{7}{8}$-in. glass blocks supported by reinforced sand-and-gravel concrete made up this panel. The blocks were on 15-in. centers with $3\frac{1}{4}$ in. between blocks, making 54 percent of the surface glass. This panel was typical of those in use with this type of glass block. In other installations the distance between blocks would range from $2\frac{1}{4}$ to 6 in. For this reason, results are presented for the glass block alone as well as for the panel, with a method included to account for various widths of concrete. Light control for this block was by means of a ribbed inner surface and a green-tinted fiber glass cavity divider (see Fig. 2).

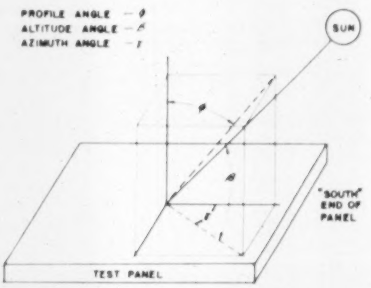


Fig. 3—Definition of Angles

Compound Louvered Device with Regular Plate Glass (Glass No. 1): This panel was a saw-tooth arrangement of sheet aluminum panels and aluminum sun-screens over a sheet of regular plate glass. A description is contained in Fig. 2. Both surfaces of the opaque panels were anodized to obtain diffusing surfaces. The sun-screen surfaces were specular and treated to resist oxidation. These panels are prefabricated in different lengths and widths, but with the same cross-sectional configuration of each saw-tooth. Light control was accomplished by the light-diffusing properties of the sheet aluminum panels and by the shading provided by the sun-screen.

Compound Louvered Device with Hammered and Etched Flint Glass (Glass No. 21): Same as just described, but with a different type of glass.

Test Panel Temperature Measurements

Glass-block temperatures were measured by thermocouples located

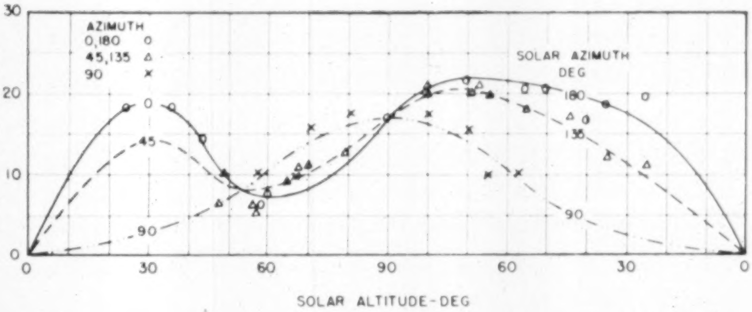


Fig. 4—Direct Solar Transmittance Characteristics of Prism-Type Glass-Block Panel

on blocks on a diagonal of the panel. The top and bottom surfaces of these blocks each had 4 thermocouples cemented into shallow grooves cut into the surfaces and placed to measure temperatures at centers of equal areas. These thermocouples could be read individually or in parallel for each surface to yield an average glass-surface temperature.

The prism-type block panel had 8 thermocouples cemented to the aluminum grid on each surface, spaced to read temperatures of equal areas. On the top surface 4 thermocouples were also cemented to the sealing mortar between the grid and the block; the bottom surface had no seal showing between the aluminum grid and the glass block. Thermocouples could be read individually or in parallel for each surface and material.

The concrete portion of the diffusing-type glass-block panel had 6 thermocouples cemented to each surface. Groups of 3 were placed at 1/6, ½, and 5/6 of the distances between blocks. These yielded temperatures at centers of equal spaces and when averaged gave an average temperature of the concrete surface. Thermocouples for each surface could be read individually as well as in parallel.

The compound louvered device had 4 thermocouples on each of 2 sunscreen panels and 2 solid panels. There were also 2 thermocouples on each of the 2 side panels. Couples on each pair of similar panels could be read individually or in parallel. Again the couples were located to give temperatures of equal areas. The glass used in conjunction with this device had 4 thermocouples cemented in shallow grooves on each surface at centers of equal areas. The thermocouples for each surface could be read individually or in parallel.

Results

Results are presented to enable predictions of the total instantaneous heat gain through the 4 previously-described light-controlling skylights and 3 sheet-glass skylights. The gain is divided into 2 parts: the transmitted solar energy (direct and diffuse) and the convected and re-radiated gain due to the combined effects of absorbed solar radiation, outdoor air temperature, low-temperature radiation exchange with the environment, and wind velocity.

Diffuse Solar Transmittance: An average diffuse solar transmittance was determined for each of the light-controlling panels from a number of tests run on overcast days. The transmitted diffuse solar radiation was obtained by subtracting the convected and re-radiated gain to the calorimeter surface from the total heat gained by the calorimeter, corrected for edge and back losses. Diffuse solar transmittances for the fenestrations tested in this program and for the sheet-glass fenestrations previously reported [1,2] are given in Table 1.

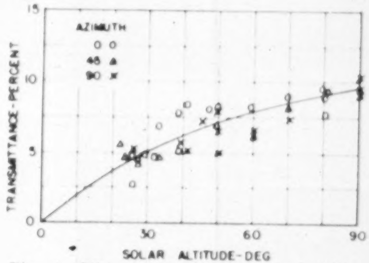


Fig. 6—Direct Solar Transmittance Characteristics of Diffusing-Type Glass-Block Panel

Table 1—Diffuse Transmittance Values of Light-Controlling and Sheet-Glass Skylights

Type of Fenestration	Range of Values	Avg
Prism-Type Glass Block Panel	0.11-0.24	0.17
Diffusing-Type Glass Block Panel	0.07-0.10	0.09
Louvered Device & Glass #1	0.10-0.11	0.11
Louvered Device & Glass #21		0.08*
Glass #1	0.65-0.68	0.67
Glass #12	0.13-0.24	0.18
Glass #21	0.47-0.59	0.48

*Calculated assuming diffuse transmittance of louvered device-glass combinations varies directly as diffuse transmittance of glass sheets alone.

Direct Solar Transmittance: Because of the directional properties of the prism-type glass block and the compound louvered device, it

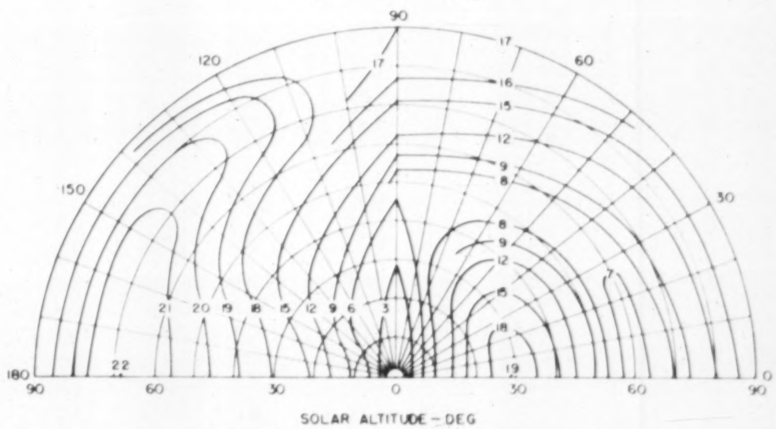


Fig. 5—Direct Solar Iso-Transmittance Curves for Prism-Type Glass-Block Panel

was necessary to determine the direct solar transmittances for all combinations of solar altitude and azimuth. Solar altitude, solar azimuth and a third term, profile angle, are shown in Fig. 3. The solar azimuth is measured from the *south* end of the panel, either clockwise or counter-clockwise with values ranging from 0 to 180 deg. Solar altitude is the angle of the sun above the horizon, and values range from 0 to 90 deg, being 90 deg at normal incidence. Profile angle, best defined by Fig. 3, ranges from 0 to + 90 deg when the sun is south of east-west axis of panel and from 0 to − 90 deg when the sun is north of east-west axis (*i.e.* solar azimuth greater than 90 deg).

Tests were run by setting the test panel at the desired solar azimuth and altitude with respect to the sun, and rotating and tilting the calorimeter to maintain these fixed angles. In other tests the panel was kept in a horizontal position and the solar altitude was allowed to change while a fixed azimuth was maintained by steadily rotating the apparatus.

The transmitted direct radiation was determined by subtracting the convected and re-radiated gain plus the transmitted diffuse solar energy from the corrected total heat gained by the calorimeter. Percentage of error in these results is of the order of 3 to 5 percent, and is mainly dependent upon the magnitude of the heat leakage corrections.

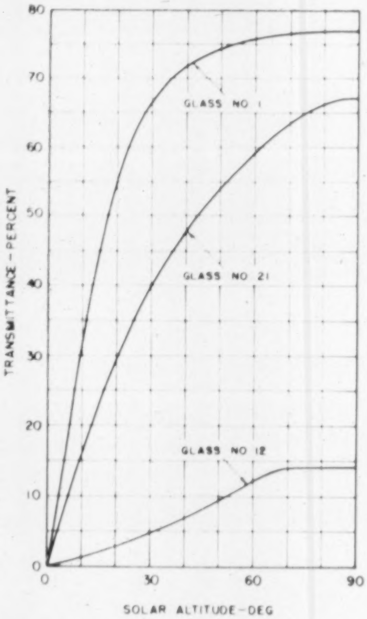


Fig. 8—Direct Solar Transmittance Characteristics of Sheet-Glass Skylights

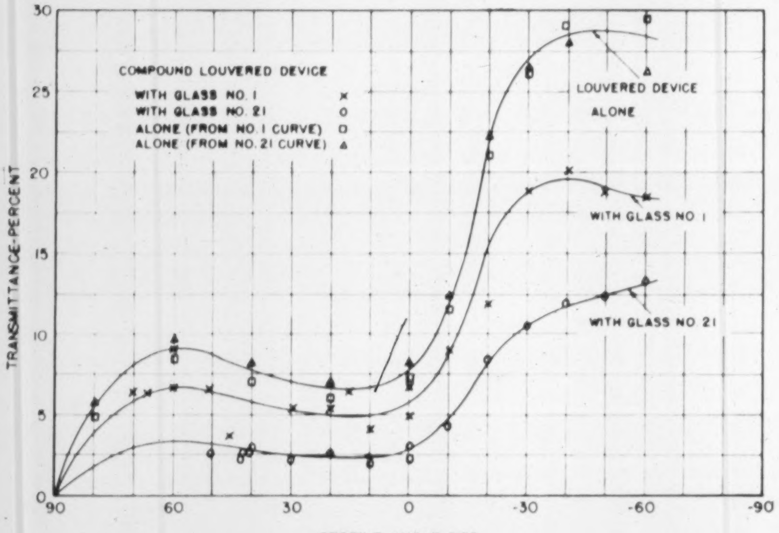


Fig. 7—Direct Solar Transmittance Characteristics of Compound Louvered Device

Results of the tests run on the prism-type glass-block panel at 45 deg increments of solar azimuth are plotted in Fig. 4. From the resultant curves and from data obtained from tests run at other azimuth angles the polar coordinate plot of Fig. 5 was made. This provides transmittance values for every sun position.

Similar tests were run on the diffusing-type block panel, but the results, given in Fig. 6, showed no significant dependence on azimuth. Hence, the direct solar transmittance is a function of only the solar altitude.

Most of the tests on the compound louvered device were run at either zero or 180 deg solar azimuth. Previous investigations have shown that the transmittance of direct solar energy by a shading device of this type is dependent only upon the profile angle (defined in Fig. 3) if the long axes of all louvers are parallel and shading by any side panels is small. At zero or 180 deg solar azimuth, the profile angle becomes simply the complement of the solar altitude. Some tests were run at different solar azimuths to corroborate the absence of an azimuth effect and to study the effect of shading by the side panels. The shading effect was negligible except at a very low solar altitude with the solar azimuth near 90 deg. As incident direct solar radiation is small under these conditions, any corrections can reasonably be neglected.

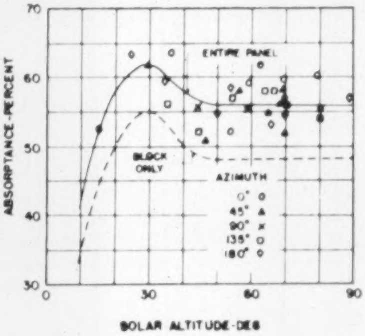


Fig. 9—Total Solar Absorptance Characteristics of Prism-Type Glass-Block Panel

Fig. 7 shows results for this shading device in conjunction with 2 different types of flat glass. The curve of direct solar transmittances for the louvered device alone was obtained by dividing the direct solar transmittance of each louvered device-glass combination by the diffuse solar transmittance of the glass.

Direct solar transmittance curves for the 3 flat glass fenestrations are shown in Fig. 8 and have been previously reported.[1,2]

Total Solar Absorptance: Solar absorptances were calculated for the 2 types of glass-block panels from the test data. Because of the approximate nature of the results, no attempt was made to differentiate between diffuse and direct components. The same calculation procedure was used for both panels.

The total absorbed solar radiation was obtained by the following equation:

$$\begin{bmatrix}\text{Total}\\ \text{absorbed}\\ \text{solar}\\ \text{radiation}\end{bmatrix} \quad \begin{bmatrix}\text{Rate of}\\ \text{heat}\\ \text{storage}\\ \text{within}\\ \text{panel}\end{bmatrix} + \begin{bmatrix}\text{Loss by low}\\ \text{temperature}\\ \text{radiation}\\ \text{exchange at}\\ \text{outer}\\ \text{surface}\end{bmatrix} + \begin{bmatrix}\text{Convection}\\ \text{loss at}\\ \text{outer}\\ \text{surface}\end{bmatrix} + \begin{bmatrix}\text{Convection}\\ \text{and re-}\\ \text{radiation}\\ \text{loss at}\\ \text{inner}\\ \text{surface}\end{bmatrix}$$

This value divided by the total incident radiation gives the solar absorptance.

Heat storage was found by measuring the temperature rise or drop at the 2 surfaces and assuming their average represented the average change within the panel. This value times the heat capacity of the panel divided by the time interval yielded the heat storage rate. The glass-block portion was treated separately from the rest of the panel.

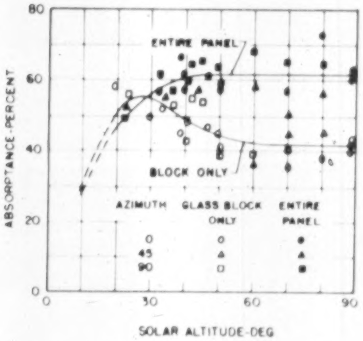


Fig. 10—Total Solar Absorptance Characteristics of Diffusing-Type Glass-Block Panel

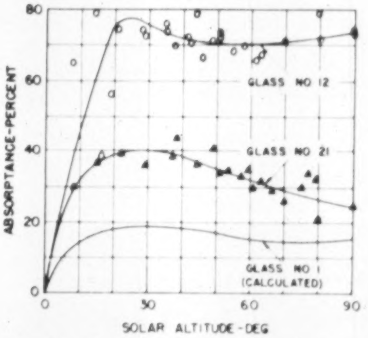


Fig. 11—Total Solar Absorptance Characteristics of Sheet-Glass Skylights

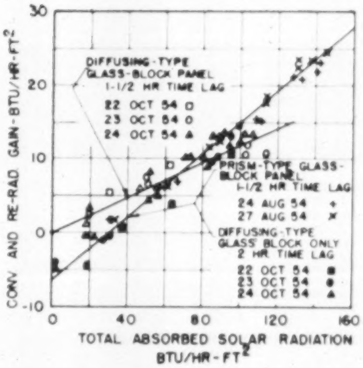


Fig. 12—Relationship Between Convection and Re-Radiation Gain and Absorbed Solar Radiation for Prism-Type and Diffusing-Type Glass-Block Panels and Diffusing-Type Glass Block alone

The low-temperature radiation exchange at the outer surface was determined from the incident low-temperature radiation (measured with the radiometer) and the surface temperatures and emissivities of the glass block and concrete.

Convection losses to the outdoors were found by using the following empirical relationship: convection coefficient [Btu per (hour) (sq ft) (Fahrenheit degree)] equals the square root of the wind velocity (miles per hour). Corrections were made for tests when the panel was not horizontal. This formula was determined from data obtained in research work on flat roofs reported recently[4].

Convection and re-radiation exchange between the inner surface and the calorimeter was based on previous calibration work[5] in which an insulated opaque panel was put into the calorimeter opening and the convection gain determined for various

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temperature differences and orientations. The radiation portion is based simply on the temperatures and emissivities of the surfaces.

The greatest source of error in calculating solar absorptance by the afore-mentioned equation lies mainly in the estimate of the rate of heat storage and to some extent in the estimate of convection loss at the outer surface. It is probable that the resulting percentage of error is, under some conditions, as great as 10 to 12 percent.

The absorptance curve for the prism-type glass-block panel and glass block alone are presented in Fig. 9. In Fig. 10 are similar curves for the diffusing-type glass-block panel. Results show no apparent solar azimuth effect for any of these curves.

Absorptances for the sheet-glass fenestrations are found in Fig. 11. Values for glass No. 1 are computed values and have been previously reported. Those for figured glasses were determined from experimental work carried on at the Laboratory and are reported here for the first time.

Absorptance values for the louvered device-glass combination were not cal-

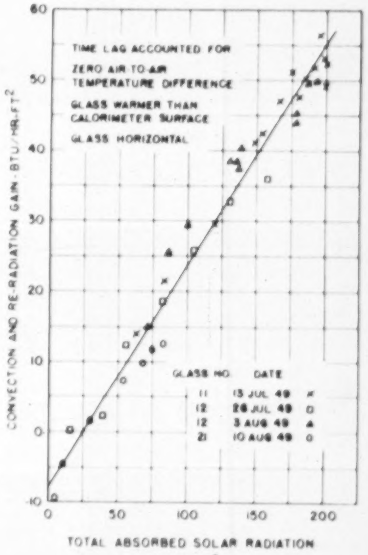


Fig. 13—Relationship Between Convection and Re-Radiation Gain and Absorbed Solar Radiation for Sheet Glass

culated because of the uncertainty in estimating the radiation and convection losses from the outer surfaces of both the louvered device and the glass.

Convection and Re-radiation Gain: Empirical relationships between the total absorbed solar radiation and the convection and re-radiation transfer from the inside of the glass-block and sheet-glass fenestrations are shown in Figs. 12 and 13.

Results for the glass-block panels were obtained from tests during which the panels were held in a fixed horizontal position and subjected to a cyclic input of solar radiation. Because of the heat-storage capacity of the panel, the convection and re-radiation gain lagged behind the absorbed radiation. When these data were compared and the time lag properly taken into account, the straight-line relationships shown in Fig. 12 were obtained. The results for the diffusing-type block are presented for both the entire panel and the glass block only, while for the prism-type panel they are given for the entire panel only. Analysis of the complex heat flow through mortar and reinforcing frame of the latter panel is beyond the scope of this paper and will be treated in a subsequent paper.

The curve (Fig. 13) relating convection and re-radiation gain and absorbed solar radiation for sheet glass was calculated from test data obtained in 1950. Data for a number of different types of glass were reported for various environmental conditions, but in all cases the glass was warmer than the calorimeter surface. Time lag was small and, though it was included, can be neglected in practical load estimating. This curve applies to any sheet of horizontal glass. A similar curve for vertical glass would show higher convection gains to the calorimeter surface due to higher convection coefficients. Also a vertical panel would have a smaller low-temperature radiation loss to its environment. The curve for sheet glass as well as the curves for the glass-block skylights are corrected to zero air-to-air temperature difference.

It will be noted in Fig. 13 that there is negative convection and re-radiation gain with no absorbed solar radiation and no air-to-air temperature difference. This is due to radiation losses from the glass to the cooler (than ambient air) upper atmosphere.

Test results show a relationship between convection and re-radiation gain and the total solar radiation transmitted by the louvered device and incident upon the glass. This is shown in Fig. 14.

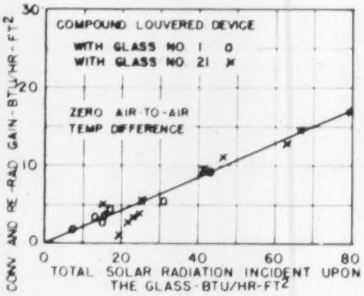


Fig. 14—Relationship Between Convection and Re-Radiation Gain and Total Incident Solar Radiation Upon the Glass for Compound Louvered Device-Glass Combinations

Estimated corrections for each 10 deg air-to-air temperature difference are as follows [for heat flow downward and in Btu per (hour) (square foot) (Fahrenheit degree)]:

A. Prism block panel or diffusing block alone	5
B. Louvered device and glass	8
C. Concrete only	7
D. Sheet glass only	10

These values should not be regarded as a precise means of obtaining heat transmission, as they are intended to give only approximate corrections. The first 2 values were obtained from test data taken during nocturnal periods when the panel and its environment were in near equilibrium. Dividing the corrected heat gain to the calorimeter by air-to-air temperature difference provided the corrections. The values for concrete and sheet glass are calculated.

Results from Typical Test Days: Graphs of results for 24-hr fixed-position tests for 3 light-controlling fenestrations are shown in Figs. 15, 16, and 17. Included are the environmental conditions to which the skylight was subjected. A valid comparison between the 3 sets of curves cannot be made due to differences in climatic conditions.

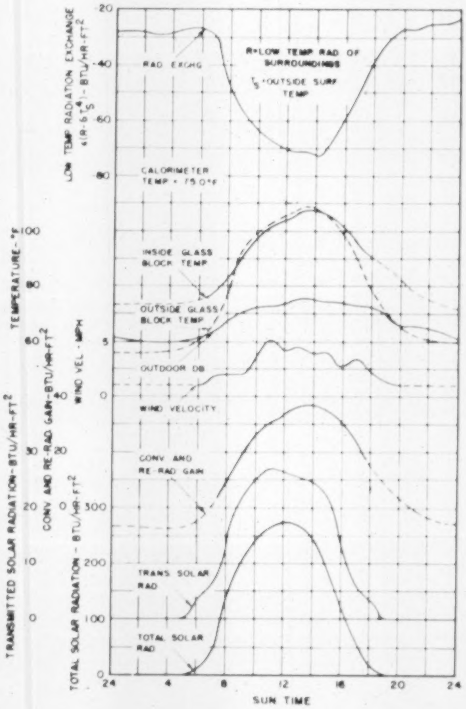


Fig. 15—Results from a Typical Test on Prism-Type Glass-Block Panel — August 27, 1954

Some idea of the effect of various weather conditions upon the total heat gain can be concluded. From Figs. 15 and 16 it is seen that the convection and re-radiation gain from the glass-block panels is affected largely by the incident solar radiation (actually the absorbed solar radiation). Air-to-air temperature differences appear to have a smaller influence on this portion of the gain. In Fig. 17 it can be seen that the opposite is true for the louvered device and glass fenestration. There appears to be little change in convection and re-radiation gain due directly to incident solar radiation when no direct solar radiation goes directly through the louvers. This portion of the gain, however, is affected largely by the outdoor-air-to-calorimeter-surface temperature difference. These conclusions may be verified by dividing the convection and re-radiation gain by the air-to-air temperature difference at any particular time (remembering for the glass-block panels to take the outdoor air temperature $1\frac{1}{2}$ hr early to account for time lag). During periods of high solar intensity the convection and re-radiation from the glass-block panels will greatly exceed the amount attributable to conducted heat, while for the louvered device-glass combinations it will exceed it by a smaller amount.

In all 3 graphs, the weather-side surface of the panel becomes cooler than the outdoor air or the calorimeter surface during a portion of the night. This is due to the low-temperature radiation loss to the cool upper atmosphere which frequently becomes greater than the convection gain to the outer surface, especially on clear nights.

Table 2—Sun Positions and Incident Direct and Diffuse Solar Radiation for a Horizontal Surface

(August 1, clear atmosphere)

Lat.	Sun Time		Solar Alt	Solar Az	Profile Angle	Direct Rad	Diffuse Rad
30 Deg North	6 a.m.	6 p.m.	9.0	106	−60	20	13
	7	5	21.5	99	−22	75	24
	8	4	34.5	92	−3	138	30
	9	3	47.5	84	6	198	33
	10	2	60.0	73	10	245	34
	11	1	72.0	52	11	272	35
	12 noon		78.0	0	12	284	36
40 Deg North	5 a.m.	7 p.m.	0.5	114	−89	2	1
	6	6	11.5	104	−50	28	16
	7	5	23.0	95	−12	82	25
	8	4	34.5	85	7	138	30
	9	3	45.5	74	15	192	32
	10	2	56.0	59	19	232	34
	11	1	64.5	35	21	257	34
	12 noon		68.0	0	22	265	35
50 Deg North	5 a.m.	7 p.m.	−4.5	113	−79	8	6
	6	6	13.5	102	−41	37	18
	7	5	23.5	90	0	85	25
	8	4	33.0	78	18	132	29
	9	3	42.0	65	25	175	32
	10	2	50.0	48	29	208	33
	11	1	56.0	26	31	232	34
	12 noon		58.0	0	32	237	34

Comparison of Total Transmitted Solar Radiation: In Fig. 18 are shown calculated curves of total transmitted solar radiation values for each of the types of skylighting reported. These values are for a design day as specified in the figure. The transmitted radiation characteristics give a good indication of the light-control properties of the various skylights. It is seen that generally the light-control skylight gives a smaller, more uniform transmission of solar energy than the sheet-glass fenestrations. Not apparent from this graph is the *light-diffusing* property of light-controlling skylights.

Application of Data to Practice

The use of the information in this paper to ascertain the instantaneous cooling load due to various skylighting fenestrations is illustrated by the following 2 typical examples. For simplicity, both examples are for a design day. To determine heat gains

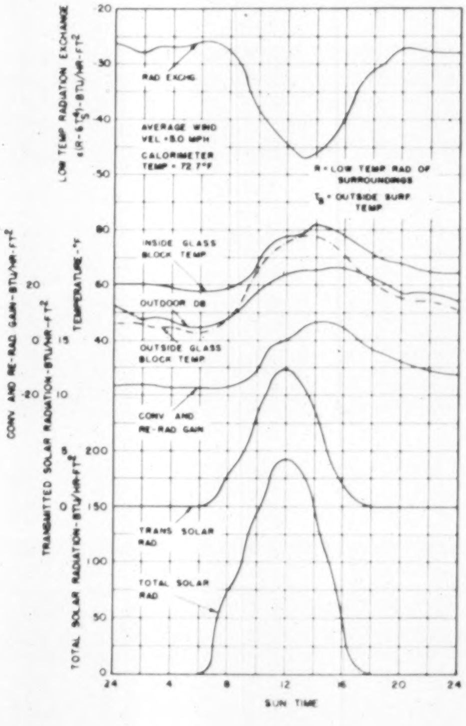
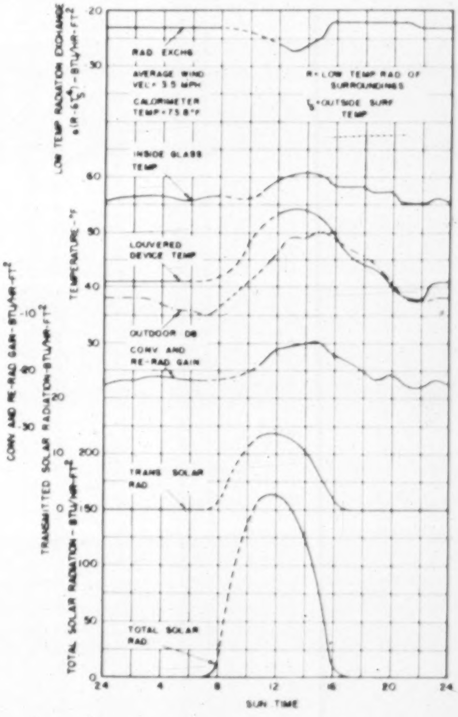


Fig.. 16—Results from a Typical Test on Diffusing-Type Glass-Block Panel — October 23, 1954

Fig. 17—Results from a Typical Test on Compound Louvered Device with Regular Plate Glass — November 15, 1954



for other conditions refer to The Guide, 1955, Chapter 13, for necessary information.

Example 1: Calculate the instantaneous cooling load due to a 5 ft × 10 ft, 18-block diffusing-type glass-block panel at 3 p.m. on August 1 at 40 deg north latitude; outdoor temperature = 95 F, indoor temperature = 80 F.

Solution: Step 1. From Table 2, obtain the solar altitude, incident direct and diffuse radiation. These are: solar altitude = 46 deg; direct radiation = 192 Btu per (hr) (sq ft); diffuse radiation = 32 Btu per (hr) (sq ft).

Step 2. Determine portion of panel surface that is glass block. Area of glass blocks equals 18 × 11 ¾ in. × 11 ¾ in. × 1/144 (sq ft) or 17.3 sq ft. Total area equals 50 sq ft; therefore, surface is 35 percent glass. The glass block and concrete portions of the panel are treated separately, assuming parallel heat flow.

Step 3. Calculate total transmitted solar radiation through glass block. Diffuse transmittance is 9 percent (Table 1) and direct transmittance 7 percent (Fig. 6) for 46 deg solar altitude and for a panel having 54 percent of the surface area glass block. The total transmitted solar radiation for the glass block alone is then 1/0.54 (0.09 × 32 + 0.07 × 192) or **30.2** Btu per (hr) (sq ft).

Step 4. Find convection and re-radiation from glass block. To take into account the time lag of the block both the absorbed solar radiation and outdoor air temperature must be taken 2 hr previous to 3 p.m. or at 1 p.m. Table 2 gives values of solar altitude = 64.5 deg; incident direct radiation = 257 Btu per (hr) (sq ft); and diffuse radiation = 34 Btu per (sq ft)(hr) at 1 p.m. The absorptance of the glass block from Fig. 10 is 42 percent. This value times the total incident radiation gives a total absorbed solar radiation equal to 122.2 Btu per (hr) (sq ft). From Fig. 12 is then obtained the convection and re-radiation gain due to absorbed solar radiation. This gain is equal to **19.5** Btu per (hr)(sq ft).

The gain due to air-to-air temperature difference must also be calculated. This difference is 15 F (assuming air temperature was 95 F at 1 p.m.), and using the previously listed correction of 5 Btu per (hr)(sq ft) for each 10 deg difference, a value of **7.5** Btu per (hr)(sq ft) is obtained. The sum of the bold face values yields the gain through the glass-block portion of the panel. This value is 30.2 + 19.5 + 7.5 or 57.2 Btu per (hr)(sq ft).

Step 5. Determine the total gain through the concrete. Refer to Table 3. Listed in this table are approximate values of heat gain for a design day. They are based on equivalent temperature differences obtained from The Guide, 1955, Chapter 13, Table 9, and a U-value of 0.7 Btu per (hr)(sq ft) (F deg) for the concrete. The gain for 3 p.m. is found to be 36 Btu per (hr) (sq ft).

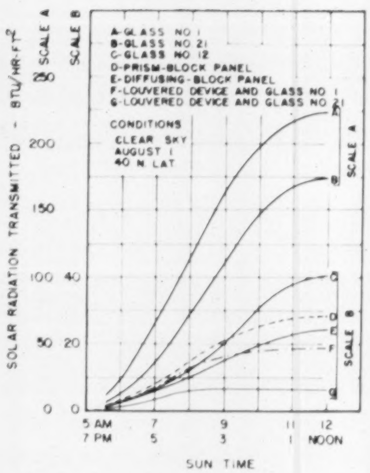


Fig. 18—Total Transmitted Solar Radiation for Various Skylighting Fenestrations

Step 6. Combine the gain through the glass block and concrete in proper proportion.

0.35 × 57.2 + 0.65 × 36 = 43.4 Btu per (hr)(sq ft) of panel, or 2170 Btu per hr for the entire panel.

Example 2. Determine the instantaneous heat gain per square foot on August 1, 50 deg north latitude at 10 a.m. for the compound louvered device-glass No. 1 combination. Assume no air-to-air temperature difference.

Solution: Step 1. Determine the profile angle, incident direct solar radiation and diffuse radiation from Table 2. These are: profile angle = 29 deg; direct radiation = 208 Btu per (hr) (sq ft); diffuse radiation = 33 Btu per (hr)(sq ft).

Step 2. Find the total transmitted solar radiation. The direct transmittance is 5 percent (Fig. 7) and the diffuse transmittance, 11 percent (Table 1). Multiplying the values of incident radiation by the proper transmittances, 0.05 × 208 + 0.11 × 33, yields the total transmitted solar radiation. This value is **14.0** Btu per (hr)(sq ft) of panel.

Step 3. Determine the convection and re-radiation gain from inside of glass. First the incident solar radiation upon the *glass* must be found. This can be done by multiplying the two components of solar radiation by the appropriate transmittances of the louvered device *alone*. For a profile angle of 29 deg, the direct transmittance is 0.07 and the diffuse transmittance 0.16 (Table 1). The solar radiation incident upon the glass becomes 0.07 × 208 + 0.16 × 33 or 19.8 Btu per (hr)(sq ft). Using Fig. 14 it is seen that the gain is then **4.1** Btu per (hr)(sq ft).

Step 4. The total gain per square foot is equal to the sum of the bold face values: 14.0 + 4.1 = 18.1 Btu per (hr)(sq ft).

Table 3—Heat Gain Through Concrete Portion of Diffusing-Type Glass-Block Panel For Design Day*

[*Btu per (hour) (square foot)*]

Time	Heat Gain	Time	Heat Gain	Time	Heat Gain
8 a.m.	0	1 p.m.	31	7	22
9	7	2	35	8	18
10	14	3	36	9	12
11	21	4	36	10	8
12 noon	27	5	32	11	6
		6	28	12 mid	4

*Values obtained using The Guide, 1955, Chapter 13, Table 9, and U value equal to 0.7 Btu (hr) (sq ft) (F deg).

Conclusions

Accurate means of determining the total transmitted solar energy have been given, together with an approximate method for the convection and re-radiation gain. The values obtained represent the instantaneous cooling load. Development of a thermal-circuit representation of glass-block panels is in the process and will bring forth more accurate means of computing the convection and re-radiation gain.

Acknowledgement

The authors wish to thank the members of the TAC on Heat Flow through Glass for their assistance in conducting this program, with special thanks to W. B. Ewing, Ewing Development Co.; D. D'Eustachio, Pittsburgh Corning Corp.; and H. B. Vincent, Owens-Illinois Glass Co. Credit for much of the test work and calculations goes to the college students who assisted with this project; J. H. Malone, L. Holstein and T. J. Vild.

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Cincinnati Is Ready—Are You?

The plans are made. The program is complete. The Cincinnati Chapter is waiting for you. Not in recent years has a meeting program contained more features. There are two symposiums and sixteen technical papers spread over a total of eight sessions. Numerous committees will meet. Most significant is the vote on the proposed By-Law Amendments which will be announced. The social program, including the Annual Banquet and the Welcome Luncheon, is carefully worked out. From the moment when Pres. John E. Haines opens the Meeting on Monday, January 23, at the Sheraton-Gibson Hotel until the last fall of the gavel, members will find events of interest and of importance on the program.

Anderson Medal to Dr. Keeton

Perhaps the most attractive feature of the whole meeting is the opportunity to be present when the F. Paul Anderson Medal is presented to Dr. R. W. Keeton. Not only is Dr. Keeton a beloved practicing physician and teacher, but this is the first time that our Society has bestowed its highest honor on a man who is not an engineer by training but an outstanding scientist. Dr. Keeton is one of the few medically-trained individuals in the country who is continuously active in our field. He has been a Society Member since 1913, and has contributed freely of his time to Society activities.

Two Symposiums

Distribution of air at high speeds used to mean speeds of 2000 feet per minute. Now these speeds are being doubled, but there are problems. The Symposium on High Velocity Air Distribution has been scheduled to give attention to this subject of great present interest. The panel of authoritative speakers will offer interesting facts concerning design, cost of construction, as well as on fan and air noises and on methods of field testing. Chairman for this Symposium is Second Vice Pres. P. B. Gordon.

Prof. C. H. Pesterfield will serve as chairman of the Air Pollution Symposium. This should attract the attention of all heating and air-conditioning engineers since a panel of experienced men will discuss the removal of air impurities from the atmospheric air to make it suitable for distribution inside buildings. Some of the topics for discussion are Health Aspects, Smog, Regulations, and Enforcement.

Welcome Luncheon Speaker

Frederick W. Giesel, business manager of the *Cincinnati Post*, is known for his interest in people and what affects them now and in the years to come. His address, *Forward — A Look at Tomorrow*, reflects the viewpoint of this world-traveled teacher, soldier, salesman and advertising man. A native Kansan, he is a graduate of University of Kansas and also holds a degree from Chicago University. He has been associated with the Scripps-Howard organization since 1929 and has been in his present assignment since 1936. He is a member of Phi Delta Kappa and Omicron Kappa. A humanitarian and a community-minded citizen, Mr. Giesel is active in many projects to help the people of Cincinnati, so his observations will be of interest.

Annual Banquet Speaker

Born and educated in England and a member of a famous English theatrical family, the Rev. Laurence H. Hall chose the ministry rather than the profession of his parents. He came to the U.S. in 1930 and entered the ministry of the Episcopal Church. Since 1952 he has been Senior Canon of Trinity Episcopal Cathedral in Cleveland, with a record of many years' service as a clergyman, social worker and prominent speaker. He has a sincere feeling for storytelling, and his subject, *Humor — America's Secret Weapon*, reflects his sense of the theater, timing, and ability to capture the audience.

One of the most important banquet features will be the installation of the Society Officers for 1956.

In every way, attendance at the 62nd Annual Meeting will be worth while for every member of ASHAE.

Method of Choosing Location of, Financing and Conducting Meetings of the Society

Resolved: That inasmuch as the Annual and Semi-Annual Meetings of the Society come under the jurisdiction of the Council, the following rules governing the handling of such meetings be adopted by the Council and published in the JOURNAL of the Society at least twice during every year, preferably just prior to each meeting.

1—The Council will select the city in which the Annual or Semi-Annual Meeting is to be held, giving due consideration to the invitations received from Chapters or members as well as to the advisability of so distributing those meetings as to make them of the greatest advantage to the general membership, and to reduce as far as possible the expense of members attending.

2—That an appropriation be made to cover the entertainment or local expenses, incurred in connection with the meeting, and the regular meeting expenses to be taken care of by the General Fund of the Society in the regular way.

3—That no registration fee or compulsory obligations of any nature be imposed on members or guests.

4—That the purchase of tickets for banquets or for any other form of entertainment that may be provided be entirely voluntary.

5—That the grouping of features and the sale of tickets for group features be discouraged.

6—That the raising of funds from manufacturers of heating apparatus be discouraged.

7—That the display of samples, or of literature, advertising the product of any manufacturer in any way, shape or form, be not permitted at the booths, registration desk, or in or about the meetings.

8—That the distribution of trade papers be entirely at the discretion of the committee in charge.

9—That the local Chapter or local members be empowered to form a General Committee with such sub-committees as may be required to handle the details of transportation, hotel accommodations, entertainment, finance, etc., and that this General Committee be requested to confer frequently with the Council, through the Executive Secretary of the Society, and to make frequent reports on progress in connection with the various matters being handled by them.

10—That the arrangements of elaborate and costly entertainment features be discouraged.

Adopted at Council Meeting, January 29, 1926.

PROGRAM—62nd ANNUAL MEETING

American Society of Heating and Air-Conditioning Engineers

January 23-25, 1956—Sheraton-Gibson Hotel, Cincinnati, Ohio

Saturday — January 21

9:00 a.m. Registration
10:00 a.m. Executive Committee
1:30 p.m. Finance Committee
1:30 p.m. Public Relations Committee
2:30 p.m. Research Executive Committee
3:00 p.m. Chapter Relations Committee

Sunday — January 22

9:30 a.m. Council Meeting
10:00 a.m. Registration
10:00 a.m. Committee on Research
3-5 p.m. Reception and Tea

Monday — January 23

9:00 a.m. Registration
10:00 a.m. FIRST SESSION (*Ballroom*)
  Call to Order — John E. Haines, President
    Greetings by A. H. Gerdsen, President, Cincinnati Chapter
    Report of President — John E. Haines
    Report of Council — A. V. Hutchinson
    Report of Treasurer — E. R. Queer
    Report of Committee on Research — B. H. Jennings
    Noise Production and Damping in Water Piping, by W. L. Rogers
12:15 p.m. WELCOME LUNCHEON (*Roof*)
  Chairman: A. W. Edwards
  Speaker: F. W. Giesel, Business Manager, Cincinnati Post
  Subject: Forward — A Look at Tomorrow
1:00 p.m. CINERAMA HOLIDAY — Capitol Theater
2:00 p.m. SECOND SESSION (*Ballroom*)
  Call to Order — John W. James, Vice President
    Performance of Covered Hot Water Floor Panels, Part I — Thermal Characteristics, by E. L. Sartain and W. S. Harris
    Thermal Design of Warm Water Ceiling Panels — A Design Manual prepared by a subcommittee of TAC on Panel Heating and Cooling and members of the Staff of the ASHAE Research Laboratory
    Heat Gain Through Glass Skylight Fenestrations, by D. J. Vild and G. V. Parmelee
2:30 p.m. THIRD SESSION (*Roof*)
  Call to Order — E. R. Queer, Treasurer
    Moisture in Transient Heat Flow, by K. R. Solvason
    Characteristics of Downward Jets from a Vertical Discharge Unit Heater, by S. M. Yen, Linn Helander and L. B. Knee
    Resistance of Rectangular Divided-Flow Fittings, by L. G. Miller, C. H. Pesterfield and R. J. Waalkes
6:45 p.m. KENTUCKY PARTY at Beverly Hills Country Club
    Buses leave Hotel from 6:00 to 6:15 p.m.

Tuesday — January 24

9:00 a.m. Registration
9:30 a.m. FOURTH SESSION (*Ballroom*)
  Call to Order — John E. Haines, President
  Report of Inspectors of Election—G. V. Sutfin
      John Everetts, Jr., Vice Chairman
    Evaluation of Equipment Noise, by H. C. Hardy and D. E. Bishop
    Electric Analogue Studies of Single Wall Sections, by Harry Buchberg
    Electric Analogger Analysis of a Cooled Structure Complex, by C. F. Kayan
10:00 a.m. FIFTH SESSION (*Roof*)
  Call to Order — John W. James, Vice President
      M. K. Fahnestock, Vice Chairman
    Index for Evaluating Heat Stress in Terms of Resulting Physiological Strains, by H. S. Belding and T. F. Hatch
    Body Evaporation During Short Exposures to Various Temperatures, Humidities, Pressures and Mass Velocities, by J. W. McCutchan
    Humidity Effects on the Odor Problem, by R. L. Kuehner
10:30 a.m. Ladies' City Trip and Luncheon at Hotel Alms
12:15 p.m. Life Members' Dutch Treat Luncheon
1:30 p.m. Chapters Conference Committee
1:30 p.m. TAC on Air Cleaning, A. B. Algren, *Chairman*
1:30 p.m. TAC on Air Distribution, W. O. Huebner, *Chairman*
1:30 p.m. TAC on Physiological Research, M. K. Fahnestock, *Chairman*
1:30 p.m. TAC on Sorption, G. L. Simpson, *Chairman*
2:00 p.m. Inspection Trips: (1) Beckjord Station; (2) Strietmann Biscuit Co.; (3) Terrace Plaza Hotel
7:00 p.m. Past Presidents' Dinner
7:30 p.m. TAC on Combustion, H. R. Limbacher, *Chairman*
7:30 p.m. TAC on Industrial Environment, P. J. Marschall, *Chairman*
7:30 p.m. TAC on Odors, T. H. Urdahl, *Chairman*
7:30 p.m. TAC on Thermal Circuits, S. F. Gilman, *Chairman*
7:30 p.m. TAC on Weather Data, John Everetts, Jr., *Chairman*

Wednesday — January 25

9:00 a.m. Registration
9:30 a.m. SIXTH SESSION (*Ballroom*)
  Call to Order — P. B. Gordon, Vice President
  Report of Inspectors on vote on By-Law Amendments—G. V. Sutfin
    Elements of Dual-Duct Design and Performance, by N. S. Shataloff
    Branch Fitting Performance at High Velocity, by C. M. Ashley, S. F. Gilman and R. A. Church
    Self-Actuated Room Control from High Speed Air, by E. F. Snyder, Jr.
12:30 p.m. Ladies' Style Show and Luncheon (*Cincinnati Club*)
2:00 p.m. SEVENTH SESSION (*Ballroom*)
  Call to Order — P. B. Gordon, Vice President
    High Velocity Air Distribution Symposium
      Duct Design — M. W. Wilson
      Economics, Costs *vs.* Velocity — John Everetts, Jr.
      Fan and Air Noises — R. D. Lemmerman
      Duct Construction — K. A. J. Monier
      Field Testing — R. D. Tutt
  Pres. John E. Haines presiding
    Report of Committee on Resolutions
    Unfinished Business
    New Business
    Recess
2:00 p.m. EIGHTH SESSION (*Roof*)
  Call to Order — John E. Haines, President
    Air Pollution Symposium
        C. H. Pesterfield, Vice Chairman
      Health Aspects — Arthur Stern
      Smog — Gordon Larsen
      Regulations — Harry Ballman
      Cleaning — J. W. May
      Practical Approach — Charles Gruber
      Enforcement — J. H. Carter
4:00 p.m. Nominating Committee Meeting
6:30 p.m. Social Hour
7:00 p.m. ANNUAL BANQUET (*Roof*)
  Toastmaster: C. P. Krantz
  Introductions and Installation of 1956 Officers
  Presentation of Past President's Award to John E. Haines
  Presentation of F. Paul Anderson Medal to R. W. Keeton, M.D.
  Speaker: The Reverend Laurence Hall, British-American Humorist
  Subject: Humor — America's Secret Weapon
  Adjournment
  Music for Dancing

Thursday — January 26

9:00 a.m. Registration
9:30 a.m. Council Meeting (organization meeting of 1956 Council)
10:00 a.m. Committee on Research (organization meeting of 1956 Committee)
10:00 a.m. Guide Committee, W. M. Wallace, *Chairman*

Summary of Chapter Meetings*

• *ARKANSAS*: Pres. J. L. Brown presented a past presidents pin to R. E. Blaylock at the October meeting. President Brown expressed appreciation for Mr. Blaylock's service to the Society and the Arkansas Chapter.

The guest speaker, J. A. Wilkerson, field engineer, Dole Manufacturing Co., was introduced by C. H. Miller, chairman, board of governors. Mr. Wilkerson discussed accumulators, their application and design. Attendance 19.

• *ATLANTA*: The program for the joint session of ASHAE and *ASRE* in October was a highly interesting talk, *Electronics in Air Conditioning*, presented by C. B. Gamble, Cary B. Gamble & Associates, New Orleans.

Pres. T. A. Barrow, Jr., made appointments to the Society's Chapters Conference Committee as recommended by the Atlanta Chapter's nominating committee: F. W. Bull as member and J. A. Marshall as alternate member. Attendance 119. Attendance ratio 0.48.

• *CENTRAL OHIO*: By unanimous vote at the October meeting Pres. R. A. Wilson was elected a member of the Chapters Conference Committee, with Vice Pres. W. A. Schoonover as alternate member.

A. V. Hutchinson, executive secretary of the Society, spoke on the proposed by-law changes to be voted on at the Annual Meeting in January and suggested that the Central Ohio Chapter be well represented at that meeting.

Following dinner, L. W. Buchanan, Westinghouse Electric Corp., Lima, Ohio, gave an informative talk on fractional horsepowers as used in air conditioning, their selection, characteristics, and desirability for various uses. Audience reaction demonstrated appreciation for the fine manner of presentation. Attendance 38. Attendance ratio 0.24.

• *CINCINNATI*: *How Not to Behave at a Convention* was the subject covered by F. J. Niswonger, Cincinnati police department, who spoke at the October meeting.

A. W. Edwards, general chairman of the 62nd Annual Meeting of the Society, briefly described the special events and sessions to be held at the meeting. Attendance 48. Attendance ratio 0.34.

• *CONNECTICUT*: F. J. Raible, Jr., program chairman, introduced Society President John E. Haines, Minneapolis, Minn., who was the featured speaker at the October meeting. In his talk on *The Next Ten Years*, he first reviewed the progress of the economy, industry and the Society during the past decade. He then projected the probable growth and predictable advances of the next ten years. He believes that ASHAE should be a leading influence as it grows to new heights. President Haines concluded with a brief review of the proposed by-law changes.

L. E. Seeley, former Society president and the first president of Connecticut Chapter, was an honored guest at the meeting. Elected as member and alternate member of the Chapters Conference Committee were C. L. L'Hommedieu and E. J. Hoagland. Attendance 45. Attendance ratio 0.22.

• *EMPIRE STATE CAPITAL*: A detailed review of snow melting problems and systems was given in October by W. P. Chapman, engineering sales service representative, National Tube Division, United States Steel Corp., Pittsburgh, Pa. His talk was entitled *Snow Melting Systems—Design and Operation*. The presentation was stimulating as well as informative. Pres. L. V. Appleby presided at the meeting. Attendance 22.

• *GOLDEN GATE*: Sacramento Valley and Golden Gate Chapters met jointly in November to hear Prof. L. E. Reukema cover the fascinating subject, *Recent Nuclear Developments Affecting the Heating Industry*. Professor Reukema traced the development of energy from the earliest times to the distant future. He described all the possible peacetime uses of atomic energy and the numerous projects which are now under way in this country, England, Canada and Russia. F. K. Crouch, Golden Gate program chairman, introduced the speaker.

Secy. Herb Duncan announced the appointment of Edward Hill, Jr., and T. E. Brewer as member and alternate member of the Chapters Conference Committee. A congratulatory letter by Pres. D. E. McLeod to the newly formed Baton Rouge Chapter was read. Attendance 106. Attendance ratio 0.32.

• *ILLINOIS*: K. M. Wilson, chief engineer, E. F. Klingler & Associates, Eau Claire, Wis., spoke at the October meeting on *Firm Specifications and Their Effect on Building Costs*. In his highly informative talk, Mr. Wilson analyzed the various methods of preparing specifications for quotations by mechanical contractors. He pointed out that there are three general types of specifications: *open*, *bidder's choice*, and *base bid*. Strongly recommending the use of the *base bid* specification, Mr. Wilson gave several examples of relative costs for the installation of mechanical equipment in school work in the State of Wisconsin, pointing out the substantial reduction in cost per square foot by use of the *base bid*. Attendance 132.

• *INDIANA*: Pres. J. W. Jackson gave a detailed discussion of chapter operation at the October meeting, successfully arousing the members' interest. President Jackson called for volunteers for the various committees and the following were placed: *Nominating*—R. C. Blackman, G. B. Supple, C. F. A. Locke, P. O. Patterson and J. T. Hardin; *Membership*—J. W. Platt and P. E. Henke; *Attendance*—J. O. LaFollette, J. E. Cockley, J. M. Teskoski, Alfred Pfau, and J. W. Platt; *Chapter Relation and Publicity*—W. F. Currise and R. O. Jackson.

President Jackson introduced the speaker, Tom Sweeny, who talked on *Do It Yourself Steam Fitting*. Mr. Sweeny's presentation centered on his own personal experience with installation of hot water baseboard radiation for his residence. Attendance 28.

• *INLAND EMPIRE*: W. P. Chapman, engineering sales service representative, National Tube Division, U. S. Steel Corp., Pittsburgh, Pa., gave a highly interesting talk at the October meeting on *Snow Melting Systems—Design and Operation*. Pres. F. W. Jenkinson presided.

• *IOWA*: A member of the Iowa Chapter, R. S. Stover, R. S. Stover Co., Marshalltown, Ia., spoke at the October meeting on *The Changing Scene of ASHAE*. Mr. Stover was appointed as member of the Chapters Conference Committee, with Pres. G. J. Kraai as alternate member. Attendance 32. Attendance ratio 0.57.

• *KANSAS*: Vice Pres. H. M. Skalla introduced the speaker at the October meeting, H. A. Lockhart, vice president of engineering, Bell & Gossett Co., Morton Grove, Ill. His topic was *A New Look at Heating and Air Conditioning Water Piping and Equipment*. Pres. A. B. Newton presided. Attendance 35.

• *MEMPHIS*: John W. James, first vice president of the Society, was introduced at the October meeting by W. L. Henson. Vice President James, Chicago, Ill., discussed current trends in the Society. He then addressed the members on the advisability of a well-informed public, so that there may be a general demand for improved heating, ventilating and air conditioning.

Mr. Henson was appointed as member of the Chapters Conference Committee, and R. H. Bolding was elected alternate member. Pres. John Hilton, II, instructed Secy. L. V. Eberle, Jr., to forward a letter of congratulations to the new Baton Rouge Chapter. Attendance 26. Attendance ratio 0.36.

• *MIAMI VALLEY*: Society Pres. John E. Haines, Minneapolis, Minn., spoke at the October meeting on *The Next Ten Years*. J. B. Rishel introduced President Haines.

N. O. Mitchell was appointed as membership chairman and D. L. Bergman as publicity chairman. Pres. D. E. Tullis

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*Note: The attendance ratios show represent the membership attendance divided by the chapter membership. These ratios will be useful as a partial indication of interest shown by local chapter members in various types of subjects programmed by the various chapters and may be useful in deciding on subjects for chapter meetings.

Journal Section

presided. Attendance 40. Attendance ratio 0.38.

• *MICHIGAN*: J. N. Livermore introduced the October speaker, P. W. Wyckoff, chief engineer, Airtemp Division, Chrysler Corp., Dayton, Ohio. Mr. Livermore discussed the *Performance and Operational Costs of Waterless Air Conditioners*. An excellent discussion period followed.

E. F. Glanz, Chapters Conference Committee member, talked about the proposed by-law changes. Attendance 77. Attendance ratio 0.21.

• *MISSISSIPPI*: The activities of the Society were discussed by First Vice Pres. John W. James, Chicago, Ill., in an interesting program given at the October meeting.

The following new officers were elected by acclamation: *President* B. L. Palmer; *Vice President* J. W. Doggett, Jr.; *Secretary* M. F. Knipp, Jr.; *Treasurer* T. D. Luke; *Board of Governors* W. H. Lambeth and W. H. Winders. Mr. Palmer was elected to attend the Annual Meeting in January. Attendance 18.

• *MONTREAL*: *Centrifugal Refrigeration* was the topic of the October guest speaker, R. St. Clair Mathison, Trane Co. of Canada, Ltd., Toronto, introduced by H. G. S. Murray. Mr. Mathison showed the basic principals of a centrifugal machine by developing a machine diagrammatically. He then showed slides illustrating typical installations, actual refinements over the basic machine, and cases where centrifugal refrigeration could be applied economically. After a brisk question period, Richard Thorn thanked the speaker for his presentation.

Pres. R. J. Ker announced that best wishes for success had been extended to the president of the Baton Rouge Chapter. Attendance 74.

• *NEBRASKA*: Two speakers addressed the members at the November meeting, presided over by Pres. T. E. Davis. Charles Holdredge, chief engineer of the Omaha metropolitan utilities district, talked on the water shortage due to air-conditioning usage. John Rickerson, an Omaha attorney, advised the audience on *The Pitfalls of Contract Writing*. Attendance 25.

• *NEW MEXICO*: Elected to the Chapters Conference Committee at the October meeting were W. M. McCall as member and C. G. Davis as alternate member.

The speaker of the evening, R. W. Haines, project engineer, Bridgers & Paxton, Albuquerque, N.M., talked on *Psychrometric Charts and Their Use*. Discussions were held on the construction of psychrometric charts, graphical solution of air-conditioning problems, high altitude effects and fundamentals of psychrometrics. Attendance 55. Attendance ratio 0.79.

• *NEW YORK*: The New York Section of *ASRE* met jointly with the New York Chapter in October, with the former as host. *ASRE* Pres. S. W. Brown cordially welcomed the ASHAE members. ASHAE Pres. Albert Giannini expressed the pleasure of the New York Chapter members in participating in the meeting.

Part of the 177 Michigan Chapter members and guests who toured the University of Michigan Phoenix (nuclear) Project

(left) D. S. Falk, president of Michigan Chapter at microphone, introducing Dean Ralph Sawyer, dean of the Graduate School of University of Michigan, who was one of the speakers. (center) Prof. Axel Marin, Department of Mechanical Engineering, University of Michigan, is shown introducing the speakers. (right) Dean G. G. Brown of the University of Michigan School of Engineering addressing the meeting

The topic for the evening was *Design Features of Air Conditioning and Refrigeration Systems for the Socony Mobil Building in New York.* The speaker, Edward Schulz, technical adviser, John W. Galbreath & Co., New York, N.Y., covered his topic by reviewing the many unusual features of this building, which has two separate air-conditioning and refrigeration systems — one for the first 14 floors and the other for the 15th to 44th floors, the latter system located in the penthouse. At the end of his talk, Mr. Schulz was given a rising vote of thanks. ASHAE Attendance 175. Attendance ratio 0.49.

• *NORTH JERSEY*: Pres. C. H. Smith opened the November meeting, following the completion of a social hour and dinner. Society Pres. John E. Haines, guest speaker for the evening, was pleasantly surprised at the close of dinner when he was presented a birthday cake with lighted candles. President Haines gave an exceedingly interesting talk on *The Next Ten Years*, showing the expansion of the last ten years and predicting the future growth for the heating and air-conditioning field, as well as for the Society. Attendance 69.

• *NORTH TEXAS*: Second Vice Pres. P. B. Gordon, New York, N.Y., was introduced as the guest speaker at the October meeting by W. P. Glancy, program chairman. Vice President Gordon supplemented his talk on *The Possibilities of Panel Cooling* with projector slides, illustrating various types of panels which have been used either experimentally or in commercial installations. The question and discussion session included such problems as air motion, dew point and experiments conducted in the ASHAE Research Laboratory. Vice President Gordon's excellent presentation on a subject of great interest was well received by the chapter.

Business of the meeting included the unanimous election of C. R. Gardner, W. S. Keeney and C. C. Young as a nominating committee. Attendance 91. Attendance ratio 0.37.

• *NORTHEASTERN OKLAHOMA*: *The New Civic Center* was the subject of a talk by M. M. McCune at the November meeting. J. C. Netherton introduced the speaker.

A motion to approve the chapter bylaws carried unanimously. Pres. J. T. McKinney presided. Attendance 31. Attendance ratio 0.51.

• *NORTHERN OHIO*: Program Chairman B. A. Schwirtz introduced D. H. Vance, vice president and executive engineer, The Korfund Co., Inc., Long Island City, N.Y., at the November meeting. Mr. Vance spoke on *Vibration and Noise Control for Air-Conditioning Equipment.*

Vice Pres. H. R. Canoyer reported that the chapter roster would be available on the first of the year. The presiding officer was Pres. L. C. Burkes. Attendance 74. Attendance ratio 0.34.

• *NORTHERN PIEDMONT*: *High Velocity Air Systems* were discussed by the October speaker, C. M. Wilson, general sales manager, Anemostat Corporation of America, New York, N.Y. C. A. Cofer, program chairman, introduced Mr. Wilson.

Pres. S. T. Oliver appointed a nominating committee, including J. E. Hart, P. L. Guest, Jr., L. L. Vaughan, C. C. Donovan and J. deB. Shepard. Attendance 47. Attendance ratio 0.34.

• *OKLAHOMA*: Speaking at the October meeting on *Vibration, Shock and Noise Control for Air-Conditioning Equipment*, Jack Harris, chief engineer, The Korfund Co., Inc., Long Island City, N. Y., used the formula for deflection and explained its use in isolating sound and vibration from the building structure. With the use of slides, the speaker illustrated the various methods and materials used in sound and vibration isolation; namely, cork, rubber and springs. Mr. Harris was introduced by R. E. Pauling, a member of the Northeastern Oklahoma Chapter. Attendance 79. Attendance ratio 0.54.

• *OREGON*: Vice Pres. W. R. Norte at the October meeting introduced R. L. Schroeder, chapter member, who gave an interesting resume of research on *Panel Heating and Cooling* which has been done at the ASHAE Research Laboratory.

Following a short recess, Vice President Norte presented Walter Featherstone, Electronics Corporation of America, whose topic was *Burning Fuels Safely Is Everyone's Problem.* The speaker described various instances of safety control lack or misapplication, with resulting boiler plant explosion and damage. He outlined the evolution of combustion safety controls and discussed the most modern types of control. Attendance 65. Attendance ratio 0.36.

• *PACIFIC NORTHWEST*: Pres. P. L. L. Winsor called upon several Society members to speak at the November meeting. Prof. E. O. Eastwood, past president of the Society, displayed his wit. A. J. Hess, member of Council, explained the purpose of the regional meeting to be held in Portland in February, and another member of Council, B. W. Farnes, spoke on the Society's Membership Committee. J. D. Kroeker spoke on Society procedures; W. R. Norte extended a cordial invitation to all to attend the regional meeting, and Cornelius Van Boeven, British Columbia Chapter president, spoke on behalf of his chapter in its desire to act as host for the 1959 Semi-Annual Meeting. It was unanimously approved that every effort be made to assist the British Columbia Chapter in gaining the role of host for this meeting.

Program chairman L. F. Christofferson introduced R. H. Groman, research engineer, Eutectic Welding Alloys Corp., Flushing, N. Y., who spoke on the development and use of new electrodes and welding technique. His lecture was accompanied by slides. Both the talk and illustration were well received by the membership. Attendance 79. Attendance ratio 0.46.

• *ST. LOUIS*: Following the committee reports in October, Pres. E. T. Clucas turned the meeting over to W. P. Norris, program chairman. Mr. Norris introduced Society First Vice President John W.

North Jersey Chapter Officers at November Meeting: (*l. to r.*) Vice Pres. W. C. Kruse, Jr.; Society Pres. John E. Haines; Pres. C. H. Smith; Executive Secretary of Society, A. V. Hutchinson; Past Pres. F. H. Faust; Former Assistant Secretary of Society, D. T. Donovan; and Treas. S. H. Nitzberg

Pres. John E. Haines guest of honor at the North Jersey Chapter November Meeting, with Chapter Vice Pres. W. C. Kruse, Jr. and Chapter Pres. C. H. Smith

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James, Chicago, Ill., who delivered a very interesting talk, *Does Air Conditioning Provide a Healthful Indoor Environment*. Attendance 65.

• *VIRGINIA*: A. B. Miller, program chairman, presented the speaker at the October meeting, S. L. North, North Brothers, Atlanta, Ga. Mr. North spoke on *Pipe and Equipment Insulation*.

Pres. T. B. Carpenter designated Mr. Miller as Chapters Conference Committee member. The alternate member will be J. E. White. Attendance 20.

• *WEST TEXAS*: P. B. Gordon, second vice president of the Society, New York, N.Y., spoke at the October meeting. Vice President Gordon covered two subjects, *What the ASHAE Means to Us and to the General Public*, and the possibilities for radiant panel cooling. V. B. Garry, program chairman, introduced Vice President Gordon.

Pres. R. B. Carow appointed the nominating committee, consisting of W. R. Anthony, L. F. Davidson, C. P. Houston and J. E. Smith. Mr. Garry appointed O. P. Harlan, Jr., as chairman of the 1955 Christmas party. Attendance 23.

• *WESTERN NEW YORK*: At the October meeting, presided over by Pres. C. W. Kaupp, Harry Farkas, senior industrial hygiene engineer for the Buffalo region of New York State, talked on *Industrial Ventilation*. Mr. Farkas, who was introduced by Robert Jorgensen, discussed approaches to removing contaminates from working areas and New York State's part in the design of ventilating systems. Attendance 42.

• *WISCONSIN*: P. J. Menden announced the guest speaker at the October meeting, D. H. Vance, vice president and executive engineer, The Korfund Co., Inc., Long Island City, N.Y. Mr. Vance talked on *Vibration and Noise Control for Air Conditioning Equipment*. He received a rising vote of thanks for his presentation. Pres. I. J. Rossiter presided at the meeting. Attendance 85. Attendance ratio 0.34.

STUDENT BRANCH

• *NORTH CAROLINA STATE COLLEGE*: Pres. R. E. Crawford reported at the October meeting that the School of Engineering would sponsor a booth at the North Carolina State Fair and that ASHAE members would be asked to work in the booth.

The speaker for the evening was T. C. Brown, associate professor of mechanical engineering, North Carolina State College. Professor Brown gave a history of ASHAE, describing the Society's part in promoting standards of heating and air conditioning. He also explained the research program of ASHAE.

MEMBERS ACTIVE IN WORLD SOLAR SYMPOSIUM

Society members took important parts in various sessions of the World Symposium on Applied Solar Energy in Tucson and Phoenix, Arizona, October 31-November 5.

The 900 scientists and businessmen who attended heard technical papers and saw an impressive international exhibit of solar devices. The exhibits and talks showed technical progress in space heating, service-water heating, high temperature furnaces, solar stoves, large-scale algal culture, space cooling, photochemistry, and power generation.

If enthusiasm and recent technical progress are any criteria, space heating by solar energy will be practical in some parts of the United States and foreign countries in the near future, and service-water heating by solar energy will become commonplace.

Of the solar heat reaching outer space, approximately one-half reaches the earth's surface. Of this, at least 50 percent, or about 100 Btu per hour, can be collected by present designs of flat-plate collectors, mirrors, and similar devices. With inexpensive concave disks, approximately three feet in diameter, it is possible to concentrate enough heat under a vessel to cook meals in tropical areas. The device is used in India, where fuel is scarce and sunshine is plentiful.

Several designs of flat-plate heat collectors were exhibited. The more common type consists of two glass plates, underneath which is a blackened metal surface from which heat can be removed by circulating a cool liquid, such as water, through tubes welded to the plate. The entire assembly is exposed to the sun by suitable facing and by tilting it upward about 50 deg to the horizontal. The collector is connected to an elevated service-water tank thus obtaining natural circulation of the heated water. A collector of approximately 50 sq ft area can heat 50 gal of service-water a day in sunny climates. Many water heaters of this general type are now in use in Florida.

Several solar-heated houses have been built, and additional ones are planned. Some collectors are designed to supply warm water, while others are to supply heated air. Flat-plate collectors for water heating require the entire roof area or a south-facing wall to collect enough heat. To satisfy night-time requirements and to carry over during cloudy days, storage tanks using water or special salts are necessary.

Direct heating of air was demonstrated at the exhibit in collectors behind glass, consisting of numerous narrow glass plates with surfaces blackened to trap the solar energy and conduct it into the air stream forced over the plates. Heat storage is obtained by flowing the heated air over a bin containing crushed rock, where heat is stored until needed. It is then made available by reversing the air flow over the rocks.

Solar heat for cooling buildings received considerable attention, because the solar energy available is greatest during the days when the need for building cooling is highest. In contrast, the greatest need for solar heat is during the time when periods of sunshine are least.

Application of adsorption-type refrigeration was proposed using a refrigerating medium that can be vaporized from water at temperatures conveniently obtained by solar collectors. Another method discussed is the use of the heat pump for both heating and cooling, with an element on the upper surfaces of the building to collect heat and to dissipate heat to the air during various parts of the cycle as required.

Among the ASHAE members on the program were: E. R. Ambrose, New York; F. C. Hooper, Toronto; R. C. Jordan, Minneapolis; E. R. Kaiser, Cleveland; J. L. Threlkeld, Minneapolis; and Austin Whillier, Pretoria, South Africa.

Additionally several members of the TA Committee on Solar Energy Utilization were prominent in various phases of the Symposium.

CANDIDATES FOR MEMBERSHIP

Listed here are the names of 124 men who are candidates for membership, or advancement in membership grade.

Members are requested to assume their full share of responsibility of receiving these candidates into membership by advising the Executive Secretary before January 31, 1956, of any whose eligibility for membership is questioned. Unless such objection is made these candidates will be voted upon by the Council.

Note: †Reinstatement *Advancement

California (*Region* 5)

Brown, C. E., Design Draftsman, Robert C. Ring, Cons. Engr., Upland.

Contarsy, H. E., Sales Engr., Tennity & Co., Los Angeles.

Emerson, R. A., Sales Engr., Robert B. Holland Co., San Francisco.

Gelwix, Kenneth, Jr., Estimator, Neil H. Peterson Co., San Francisco.

Nicoll, S. F.,† Sales Engr., Sarcotherm Controls Inc., San Francisco.

Price, R. B., Sales Engr., Charles M. Bailey Co., San Francisco.

Wilson, J. W., Owner, Claus Sheet Metal Co., Vallejo.

Connecticut (*Region* 1)

Rogers, L. D., Sales Repr., The Trane Co., Trumbull.

District of Columbia (*Region* 2)

Malmeth, Charles, Jr. Engr., Bureau of Ships, Washington.

Talley, M. W., Estimator, E. J. Febrey & Co., Inc., Washington.

Georgia (*Region* 6)

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OBITUARIES

WILFRED J. FRITZ
Seattle, Wash.

Wilfred John Fritz, 54, heating engineer and district sales manager, Iron Fireman Manufacturing Co., Seattle, Wash., died suddenly on November 14, 1955 at his home.

Mr. Fritz was born in St. Cloud, Minn., on January 10, 1901 and received his M.E. from the University of Minnesota in 1920. He worked in Minneapolis for Holland Furnace Co. and Cutler-Bell Co. following graduation. Later he was connected with the Ray Co., San Francisco, and Morrison Electric, Portland, Ore. He joined Iron Fireman Manufacturing Co. in 1934. Over the years, he worked on the research and development of oil burners and viscosity devices.

A member of the Society since 1952, Mr. Fritz was associated with the Pacific Northwest Chapter. He was active in church, Boy Scout and Little League work. He was a member of the Nile Temple of the Shrine; Lodge No. 176 F. & A. M., Minneapolis; and the Harrisburg, Pa., Consistory, a Scottish Rite body.

Surviving are his wife, Gladys Hudson Fritz; a daughter, Zoe; a son, Jack, of Seattle; and his sister, Mrs. Margaret Carney, and two brothers, Robert and Hugh, of Minneapolis.

C. B. SKINNER, JR.
New Orleans, La.

Charles B. Skinner, Jr., died recently of a heart attack at the age of 32. For the last two years he was employed by W. H. Grant, Jr., of New Orleans as a mechanical engineer.

Mr. Skinner was born in New Orleans on July 27, 1923. He studied mechanical engineering from 1940-48 at Tulane University, gaining his B.E. and M.E. After graduation he joined the C. B. Skinner Co. He also was connected with Buda Engine & Equipment Co.

Mr. Skinner, who joined the Society in 1954, leaves a widow.

E. A. VANDERSLICE, JR.
Philadelphia, Pa.

Word has been received of the recent death of Ephraim A. Vanderslice, Jr., 57, director of engineering, Howell Lewis Shay Associates, Architects and Engineers, Philadelphia, Pa.

Born in Camden, N.J., on April 16, 1898, he received an M.E. from Drexel Institute in 1921. He started as a draftsman for I. H. Francis in Philadelphia, Pa. In later years, he served as engineer in charge of the mechanical department for Simon & Simon and for Ballinger & Co., both of Philadelphia. He started a business of his own in 1947.

Mr. Vanderslice was a registered engineer in New Jersey and Pennsylvania. He joined the Society in 1950. Mr. Vanderslice was a resident of Haddonfield, N. J.

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*Member of Committee on Research

ASHAE — OFFICERS OF CHAPTERS AND BRANCHES

(61 Chapters; 1 Special Branch; 6 Student Branches)

Date indicates year organized; an address and no city shown signifies same city as headquarters; numeral in parentheses indicates zone.

ARIZONA

Arizona: 1953. Hdqrs., Phoenix. Meets, 1st Mon. PRES, W. A. Biddle, 3817 N. 15th Ave. SECY, E. P. Maxwell, 39 W. Adams St.

ARKANSAS

Arkansas: 1952. Hdqrs., Little Rock. Meets, 3rd Tues. PRES, J. L. Brown, 212 Terminal Warehouse Bldg. SECY, H. H. Himstedt, 510 E. Third St.

CALIFORNIA

Golden Gate: 1937. Hdqrs., San Francisco. Meets, 1st Thurs. PRES, D. E. McLeod, 2415 Green St. (23). SECY, Herb Duncan, 938 N. Linden Ave., South San Francisco.

Sacramento Valley: 1952. Hdqrs., Sacramento. Meets, 1st Wed. PRES, R. A. Sarro, 5412 Argo Way (21). SECY, M. J. Delavan, 405 Meister Way (19).

Southern California: 1930. Hdqrs., Los Angeles. Meets, 1st Tues. PRES, J. L. McCullough, 1978 S. Los Angeles St. (11). SECY, W. J. Biggar, 6620 Telegraph Rd. (22).

COLORADO

Rocky Mountain: 1944. Hdqrs., Denver. Meets, 1st Wed. PRES, L. L. DeLong, 2027 S. Washington St. (10). SECY, W. V. Burbank, P.O. Box 840.

CONNECTICUT

Connecticut: 1940. Hdqrs., New Haven. Meets, 3rd Thurs. PRES, E. J. Hoagland, 257 Whitney St., Hartford. SECY, J. D. Pierce, 775 Capitol Ave., Hartford.

DISTRICT OF COLUMBIA

Washington: 1935. Hdqrs., Washington. Meets, 2nd Wed. PRES, W. C. Reamy, Jr., 720 Mills Bldg. (6). SECY, S. H. Robbins, Jr., 2117 M Street, N.W. (7).

GEORGIA

Atlanta: 1937. Hdqrs., Atlanta. Meets, 2nd Mon. PRES, T. A. Barrow, Jr., 302 Ponce de Leon Ave., N.E. (8). SECY, J. A. Marshall, 1415 Howell Mill Rd., N.W.

ILLINOIS

Illinois: 1906. Hdqrs., Chicago. Meets, 2nd Mon. PRES, G. G. Freyder, 72 W. Adams St. (90). SECY, Herbert Kreisman, 117 N. Desplaines St. (6).

INDIANA

Indiana: 1943. Hdqrs., Indianapolis. Meets, 4th Tues. PRES, J. W. Jackson, 1531 N. Pennsylvania St. (2). SECY, G. W. Vogel, 31 E. Georgia St. (4).

IOWA

Iowa: 1940. Hdqrs., Des Moines. Meets, 2nd Tues. PRES, G. J. Kraan, 907 Sixth Ave. (14). SECY, W. A. Schwoum, Physical Plant Dept., Iowa State College, Ames.

KANSAS

Kansas: 1951. Hdqrs., Wichita. Meets, Tues. after 1st Mon. PRES, A. B. Newton, 3511 Elmwood Dr. (17). SECY, T. L. Roberts, 2008 S. Parkwood Lane (18).

KENTUCKY

Bluegrass: 1954. Hdqrs., Louisville. Meets, 2nd Mon. PRES, W. M. Pace, 218 Don Allen Rd. (7). SECY, R. B. Duggan, 41 Beechwood Rd., Jeffersonville, Ind.

LOUISIANA

Baton Rouge: 1955. Hdqrs., Baton Rouge. Meets, 3rd Wed. PRES, C. S. Woodruff, P.O. Box 358. SECY, A. J. Mayers, Jr., 7732 Goodwood Ave.

Delta: 1939. Hdqrs., New Orleans. Meets, 3rd Tues. PRES, W. B. Martin, Jr., 635 Commercial Pl. (12). SECY, R. K. Goode, 3613 Pine St. (25).

Shreveport: 1948. Hdqrs., Shreveport. Meets, 3rd Thurs. PRES, R. S. Segall, 848 River Rd. SECY, A. L. Jones, Jr., 753 Gladstone.

MARYLAND

Baltimore: 1949. Hdqrs., Baltimore. Meets, 3rd Wed. PRES, E. J. Morris, 813 N. Calvert St. (2). SECY, E. J. Dull, 1122 N. Charles St. (1).

MASSACHUSETTS

Massachusetts: 1912. Hdqrs., Boston. Meets, 3rd Tues. PRES, G. D. Fife, 79 Milk St. SECY, R. F. Curry, 80 Ripley St., Newton Centre (59).

Western Massachusetts: 1955. Hdqrs., Springfield. PRES, R. E. Cross, 114 Boston Rd. SECY, F. A. Ferraro, 172 Chestnut St.

MICHIGAN

Michigan: 1916. Hdqrs., Detroit. Meets, 1st Mon. after 10th of month. PRES, D. S. Falk, 4864 Woodward Ave. (1). SECY, J. H. Spitzley, 1200 W. Fort St. (26).

Western Michigan: 1931. Hdqrs., Grand Rapids. Meets, 2nd Mon. PRES, S. M. Paganelli, 47 N. Division Ave. SECY, B. J. Walter, 333 Fuller Ave., N.E.

MINNESOTA

Minnesota: 1918. Hdqrs., Minneapolis. Meets, 1st Mon. PRES, J. S. Locke, 2753 Fourth Ave., S. (8). SECY, F. G. Vogt, 6530 W. Lake St. (16).

MISSISSIPPI

Mississippi: 1953. Hdqrs., Jackson. Meets, 4th Mon. PRES, B. L. Palmer, 1808 N. Mill St. (2). SECY, M. F. Knipp, Jr., 2858 Arbor Hill Dr. (4).

MISSOURI

Kansas City: 1917. Hdqrs., Kansas City. Meets, 1st Mon. PRES, A. S. Hart, Jr., 3601 E. 18th St. (27). SECY, S. C. McCann, 210 W. Tenth St. (5).

St. Louis: 1918. Hdqrs., St. Louis. Meets, 2nd Tues. PRES, E. T. Clucas, 4354 Olive St. SECY, N. J. Hubbuch, Jr., 7020 Cornell, University City (5).

NEBRASKA

Nebraska: 1940. Hdqrs., Omaha. Meets, 2nd Tues. PRES, T. E. Davis, 4303 Dodge St. SECY, C. A. Failer, 1802 Mason St. (2).

NEW JERSEY

North Jersey: 1952. Hdqrs., Newark. Meets, 2nd Tues. PRES, C. H. Smith, 2300 N. Stiles St., Linden. SECY, M. C. Christesen, 196 Everett Pl., Englewood.

NEW MEXICO

New Mexico: 1954. Hdqrs., Albuquerque. Meets, 3rd Mon. PRES, H. F. Munn, 419 Granite, N.W. SECY, J. K. James, 4462 Avenida del Sol.

NEW YORK

Central New York: 1944. Hdqrs., Syracuse. Meets, 4th Wed. PRES, L. A. Childs, 308 Forest Hill Dr. (6). SECY, Merle Weninger, 230 Goodrich Ave. (5).

Empire State Capital: 1951. Hdqrs., Albany. Meets, 2nd Wed. PRES, L. V. Appleby, N. Pearl & Van Woert Sts. (4). SECY, E. J. Mahoney, 45 Colvin Ave.

New York: 1911. Hdqrs., New York. Meets, 3rd Mon. PRES, Albert Giannini, 385 Madison Ave. (17). SECY, Carl H. Flink, 62 Worth St. (13).

Western New York: 1919. Hdqrs., Buffalo. Meets 2nd Mon. PRES, C. W. Kaupp, 271 Delaware Ave. (2). SECY, J. P. Guerra, 34 E. Depew Ave. (14).

NORTH CAROLINA

Northern Piedmont: 1952. Hdqrs., Greensboro. Meets, 2nd or 3rd Fri. PRES, L. R. Gorrell, 1412 Chester Rd., Raleigh. SECY, C. E. Amick, 1042 Oakmont Ave.

Southern Piedmont: 1952. Hdqrs., Charlotte. PRES, L. F. Lawrence, Jr., 212 Greystone Rd. SECY, G. C. Garrett, P.O. Box 3697.

OHIO

Central Ohio: 1944. Hdqrs., Columbus. Meets, 3rd Mon. PRES, R. A. Wilson, 2240 N. High St. SECY, T. R. Walker, 182 N. Yale Ave.

Cincinnati: 1932. Hdqrs., Cincinnati. Meets, 1st Tues. PRES, A. H. Gerdsen, 224 E. Second St. (2). SECY, T. D. Reilley, 1905 Dunlap St. (14).

Miami Valley: 1950. Hdqrs., Dayton. Meets, 1st Wed. PRES, D. E. Tullis, 1720 Parkhill Drive (6). SECY, L. P. Brehm, Jr., 111 S. Broomfield Rd.

Northern Ohio: 1916. Hdqrs., Cleveland. Meets, 2nd Mon. PRES, L. C. Burkes, 1792 E. 40th St. SECY, R. A. Urban, Sr., 1740 E. 12th St. (14).

Toledo: 1954. Hdqrs., Toledo. PRES, C. F. Hoffman, 523 Spitzer Bldg. (4). SECY, R. I. Fruth, 1316 Adams St. (2).

OKLAHOMA

Oklahoma: 1935. Hdqrs., Oklahoma City. Meets, 2nd Mon. PRES, J. R. Patten, 1726 N.W. Fifth (6). SECY, A. C. Shelley, 2946 Nimitz (12).

Northeastern Oklahoma: 1948. Hdqrs., Tulsa. Meets, 2nd Tues. PRES, J. T. McKinney, P.O. Box 5145 (16). SECY, G. A. McCune, 1908 Utica Square.

OREGON

Oregon: 1939. Hdqrs., Portland. Meets, Thurs. after 1st Tues. PRES, Dick Blankenship, Cascade Bldg. (4). SECY, W. B. Hayes, 707 Portland Trust Bldg. (4).

PENNSYLVANIA

Philadelphia: 1916. Hdqrs., Philadelphia. Meets, 2nd Thurs. PRES, A. M. Robertson, 1200 Locust St. (7). SECY, R. J. Sigel, 822 Montgomery Ave., Narberth.

Pittsburgh: 1919. Hdqrs., Pittsburgh. Meets, 3rd Mon. PRES, C. L. Benn, 420 Blvd. of Allies (19). SECY, E. H. Riesmeyer, Jr., 231-33 Fort Pitt Blvd. (22).

SOUTH CAROLINA

South Carolina: 1954. Hdqrs., Columbia. PRES, R. K. Rouse, P.O. Box 3731, Greenville. SECY, B. A. Leppard, P.O. Box 3294, Station "A," Greenville.

TENNESSEE

Memphis: 1944. Hdqrs., Memphis. Meets, 3rd Mon. PRES, John Hilton, II, 4443 Sequoia. SECY, L. V. Eberle, Jr., 1358 Clementina.

TEXAS

North Texas: 1938. Hdqrs., Dallas. Meets, 3rd Mon. PRES, J. A. Ray, 4411 Belmont Ave. (4). SECY, G. H. Meifert, 3328 Greenbrier Dr. (25).

South Texas: 1938. Hdqrs., Houston. Meets, 3rd Fri. PRES, F. M. Neil, P.O. Box 13197 (19). SECY, A. B. Ullrich, 2520 Huldy St. (19).

Southwest Texas: 1946. Hdqrs., San Antonio. Meets 3rd Tues. PRES, F. B. Frazee, 1013 Riverside Dr., Austin (4). SECY, J. L. Rea, Jr., 300 West 8th St., Austin.

West Texas: 1953. Hdqrs., Lubbock. Meets, 1st Tues. PRES, R. S. Carow, P.O. Box 3206. SECY, H. L. Mayes, P.O. Box 151.

UTAH

Utah: 1944. Hdqrs., Salt Lake City. Meets, 3rd Thurs. PRES, R. C. Evans, 2549 Wilmington Ave. (6). SECY, G. E. Wright, Jr., Dooly Bldg.

VIRGINIA

Virginia: 1946. Hdqrs., Norfolk. Meets, 3rd Wed. PRES, T. B. Carpenter, 8400 Millard St. SECY, C. G. Conaway, Jr., 4701 Colley Ave. (5).

WASHINGTON

Inland Empire: 1950. Hdqrs., Spokane. Meets, 1st Mon. PRES, F. W. Jenkinson, 228 Hutton Bldg. SECY, J. A. Doyle, W. 3018 Broad.

Pacific Northwest: 1928. Hdqrs., Seattle. Meets, 2nd Tues. PRES, P. I. L. Winsor, 20031 Marine View Dr., S.W. (66). SECY, M. W. McKinstry, 4017 McGilvra St. (2).

WISCONSIN

Wisconsin: 1922. Hdqrs., Milwaukee. Meets, 3rd Mon. PRES, E. J. Rossiter, 231 W. Wisconsin Ave. (3). SECY, R. D. Rodwell, 152 W. Wisconsin Ave. (3).

CANADA

British Columbia: 1952. Hdqrs., Vancouver. Meets, 2nd Wed. PRES, Cornelius Van Boeyen, 636 Drake St. (3). SECY, A. C. Martin, 425 W. Second Ave.

Manitoba: 1935. Hdqrs., Winnipeg. Meets, 4th Thurs. PRES, G. C. Davis, 212 Waverly St. (9). SECY, A. H. Millar, 342 Mandeville St., St. James (12).

Montreal: 1936. Hdqrs., Montreal. Meets, 3rd Mon. PRES, R. J. Ker, 5000 Namur St. (9). SECY, W. E. Jarvis, P.O. Box 61.

Ontario: 1922. Hdqrs., Toronto. Meets, 1st Mon. PRES, D. L. Angus, 25 Bayview Wood. SECY, H. R. Roth, 57 Bloor St., W.

Ottawa Valley: 1952. Hdqrs., Ottawa. Meets, 3rd Tues. PRES, E. J. Schoenherr, 32 Clarey Ave. (1). SECY, D. W. Banton, 360 Richmond Rd. (3).

SPECIAL BRANCH

Switzerland: 1952. Hdqrs., Zurich. PRES, H. C. Bechtler, Anemonenstrasse 40 (47). SECY, Walter Hausler, Erbstrasse 2, Kusnacht.

STUDENT BRANCHES

North Carolina State College: 1948. Hdqrs., Raleigh. PRES, R. E. Crawford, 106½ Logan Ct. SECY, S. R. Moore, Box 4317, State College.

Oregon State College: 1949. Hdqrs., Corvallis. Meets, 1st Wed. after 1st Tues. PRES, P. I. Anderson, 202 N. 10th. SECY, D. W. Strahan, 233 Mall St.

Purdue University: 1948. Hdqrs., W. Lafayette, Ind. PRES, D. B. Doucette, Purdue Student Branch, ASHAE, School of Mech. Engrg. SECY, J. W. Deabler, Purdue Student Branch, ASHAE, School of Mech. Engrg.

Texas A. & M. College: 1946. Hdqrs., College Station. Meets, 2nd and 4th Tues. PRES, D. F. Carroll, Box 6264. SECY, C. W. Farrar, Jr., Rt. 1, Box 339, Bryan.

University of Detroit: 1949. Hdqrs., Detroit. Meets, 1st Tues. PRES, L. J. Hayes, Jr., 16254 Santa Rosa Dr. (21). SECY, E. F. Hoelscher, Jr., 14283 Cherrylawn (38).

University of Toronto: 1951. Hdqrs., Toronto. PRES, W. A. Stewart, 86 Roxborough St., W. (5). SECY, R. M. Davies, 144 Manor Rd., E.

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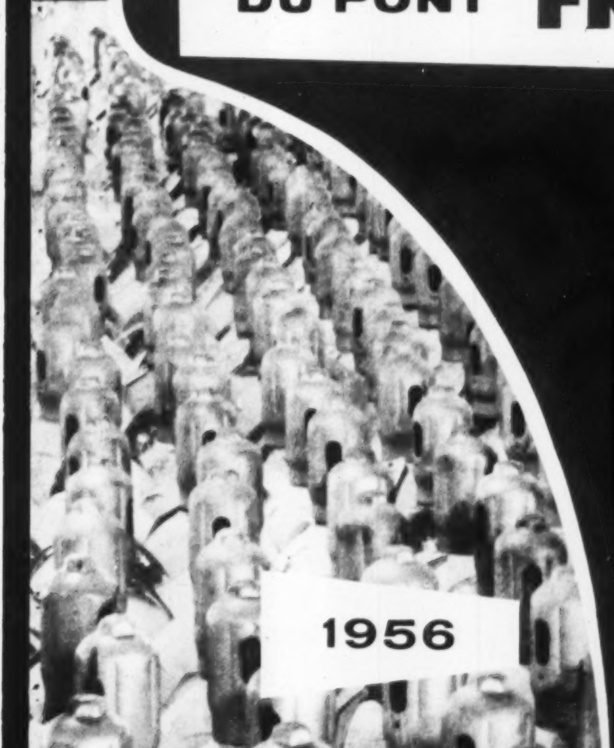

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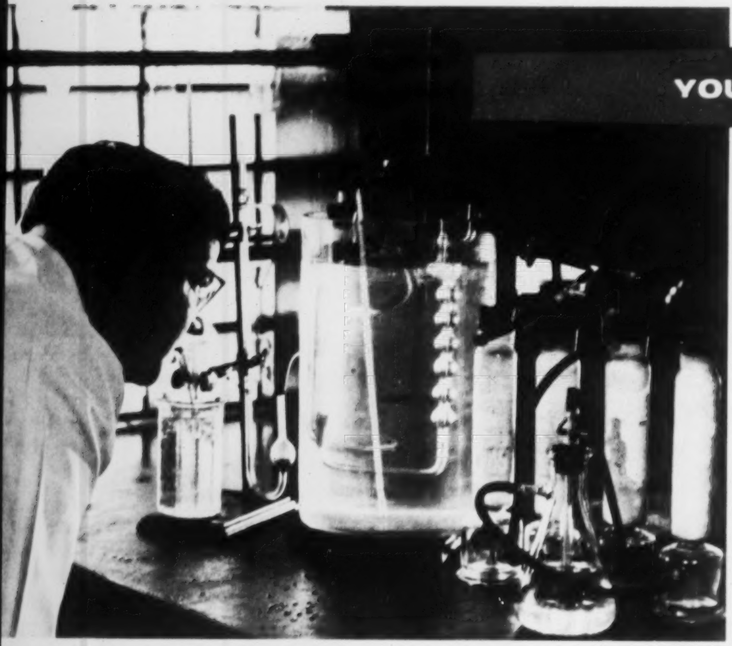

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YOU GET A COMPLETE LINE

Today, as over the past 25 years, Du Pont research is at work developing new refrigerants to meet the needs of the air conditioning and refrigeration industry. Now, you can specify a "Freon" refrigerant for any type of installation. Reciprocating, centrifugal or rotary compressors; household, commercial or industrial applications—there's a "Freon" refrigerant for any air conditioning or refrigerating job.

"Freon-11"	**Boiling point 74.8°F.**
"Freon-12"	**Boiling point -21.6°F.**
"Freon-22"	**Boiling point -41.4°F.**
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Chart Location OPERATIONS
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During the late 1920's the shortcomings of refrigerants then in use became more and more serious. These refrigerants were difficult to handle, irritating, flammable or toxic. Scientists then set out to find a better refrigerant.

In 1930 tests on a chemical group of fluorinated hydrocarbons showed that they had all the desired properties of an ideal refrigerant. Since 1931, when they were offered for sale as "Freon"* refrigerants, they have played a major part in the growth of the air conditioning and refrigeration industry. Without "Freon", air conditioning could not have achieved the acceptance it has today.

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1931 —Experience has no competitors — 1956

1931 KINETIC *1956*

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"FREON"

SAFE REFRIGERANTS

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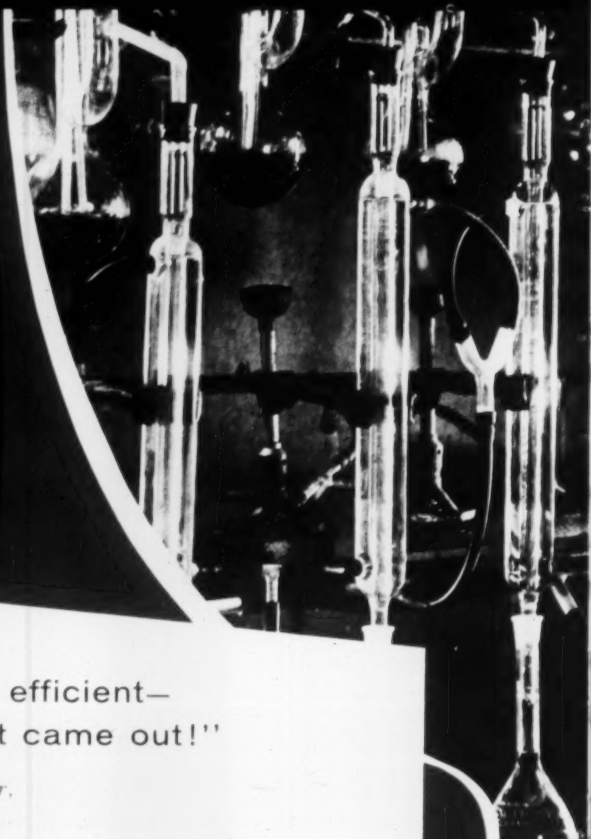
Let these long-time users tell you why you should *always ask for* "FREON"



"'FREON' is 100% safe and efficient—we've used it ever since it came out!"

Says Mr. Martin Buschman, Service Manager,
Arundel Ice Cream Company, Inc.,
Baltimore, Maryland

"20 years of use have made me 100% satisfied with the quality of 'FREON' refrigerants!"

Says Morris Silver, Chief Engineer,
Republic Air Conditioning Company,
Philadelphia, Pennsylvania

"18 years ago I put in systems—charged with 'FREON'—that are still in daily service!"

Says Mr. Karl Becht,
Hub Refrigeration Service Company,
Bronx, New York

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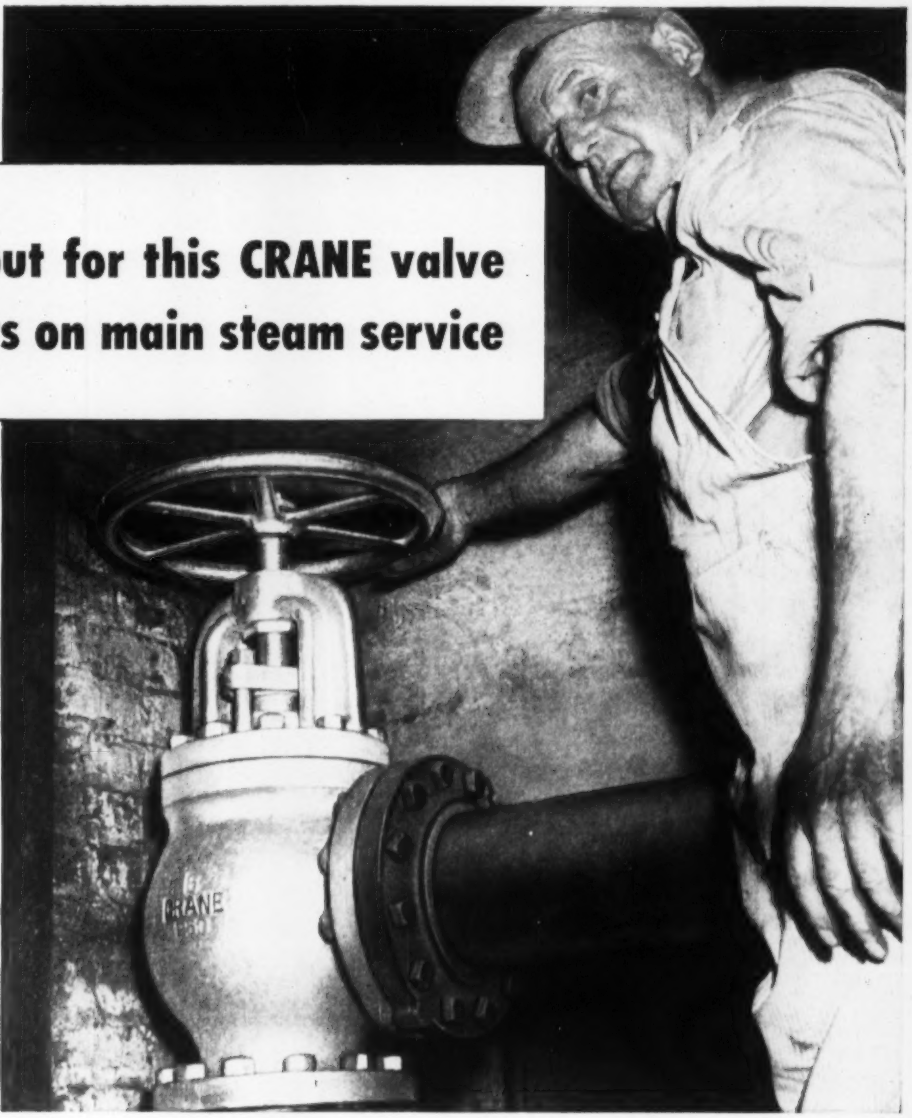
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

EXPERIENCE HAS NO COMPETITORS

No time out for this CRANE valve in 40 years on main steam service



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They were installed in 1915 on the main steam leads from boilers in the plant at Delavan, Wis., now occupied by The George W. Borg Corporation. In 40 years' uninterrupted service these Crane valves never failed to operate properly nor caused a shutdown. With but routine maintenance, they opened fully and were seated tight with ease under infrequent operation. Working pressure of boilers was originally 150 psi.—later reduced to 75 psi. This year, both valves were retired. The new replacements are Crane quality valves, of course.

Crane iron valves in particular need no introduction to thrifty buyers. In all grades, Crane iron castings generously exceed the requirements of equivalent A.S.T.M. specifications. Crane Ferrosteel, for instance, used in 250-pound valves is 35% stronger than ordinary cast iron.

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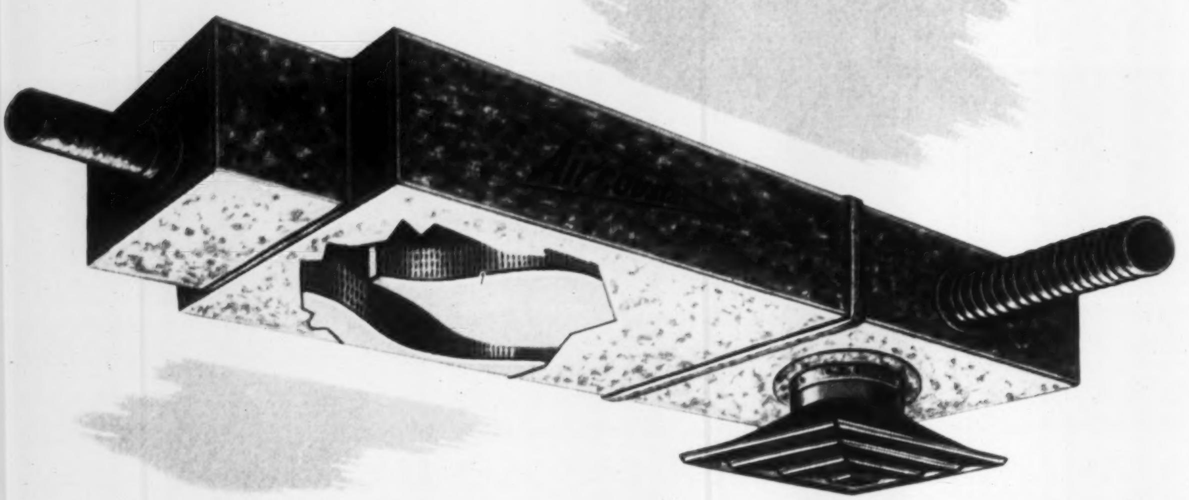

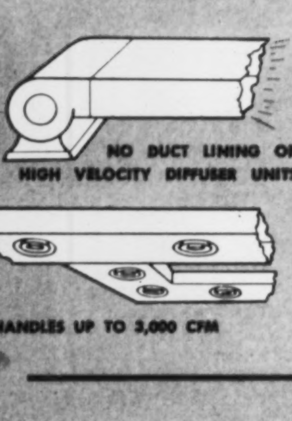

NO DUCT LINING OR HIGH VELOCITY DIFFUSER UNITS

HANDLES UP TO 3,000 CFM

HI-VALVE HANDLES UP TO 3,000 CFM

Hi-Valve Aircoustats are installed directly in the ductwork, eliminating the need for duct lining and high velocity diffuser units. Because of the high capacity, a single unit can handle silencing and pressure reduction for up to 3,000 C.F.M. and is adaptable to split systems as well as single diffuser operation.

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HI-VALVE IS VERSATILE

Hi-Valve Aircoustat is available for small-duct systems and is readily adaptable to pneumatic control.

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Easily installed in branch ductwork ahead of the diffusers, Hi-Valve Aircoustat eliminates the need for expensive duct line mufflers and high velocity diffuser units . . . effecting substantial savings in space and on equipment and installation costs.

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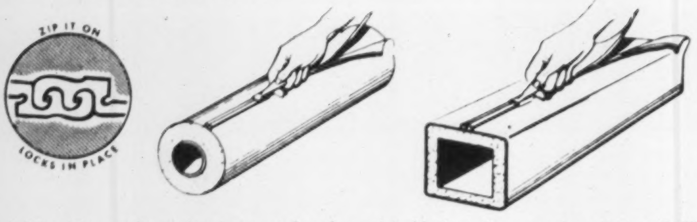

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- an integral, all poly-vinyl zip closure insures watertight, airtight longitudinal points.
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- nonflammable; will not support combustion.
- furnished in several standard colors or in color combinations for identification purposes.
- points and fittings: covered with tape made from same poly-vinyl compound as covering itself; sealed with vinyl sealing liquid to insure uniform characteristics and the same protection for the entire installation.

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Tensile Strength in psi	1600
Elasticity	Excellent
Temperature limitations	+200° F to −60° F
Moisture Vapor Transmission Rate ASTM test # Jan-P-127	1.5 gms/100sq. in. /24 hrs.
Dielectric strength /mil of thickness approx.	1000V
Insulation Resistance	greater than 1000,000 megohms

No tendency to rot or check after prolonged exposure to underground conditioning or as result of exposure to weather.

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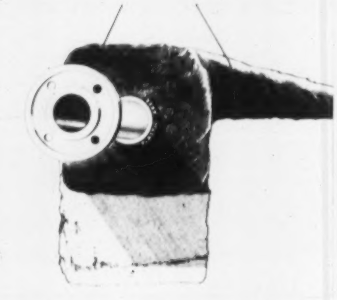
INSUL-FIL

protection plus insulation for underground steam distribution systems —



composition and characteristics

The thermal insulation is a volcanic rock which has been crushed, graded and screened . . . then quick-heated and expanded, at 2000° F to produce glass-like beads or pearls containing a maze of sealed dead-air cells which make the material light and gives it excellent insulating qualities. Combined with asphalt, which also has good insulating qualities of its own, this is Insul-Fil . . . an excellent insulation that is impervious to moisture.

Introduction of steam or high pressure hot water to a new underground distribution system causes pipes to expand in the loosely tamped Insul-Fil. Simultaneously, the developed heat causes a plastic coating to form around the hot pipes, building up to a 1" to 1½" plastic zone which does not restrict pipe movement. The insulating aggregate in the asphalt produces structural stability in the insulating mass. Around this plastic zone a cellular structure develops, creating a second zone which has exceptionally high insulating qualities.

properties

Temperature limit	Used for steam up to 400°F
Thermal conductivity	Overall K value 0.451
Moisture resistance	Excellent
Weight	28 pounds/cubic foot
Electric insulation	High dielectric strength

miracle adhesives corporation

insulation fastening

anchor fastening devices

Miracle Surface Anchors provide firm support for block or board types of insulation, furring strips, wood runners, conduits, pipes, fixtures, etc. on all types of clean, rigid surfaces. These devices also provide anchorage in otherwise inaccessible locations. Miracle Surface Anchors consist of perforated metal plates 2" x 2" or 2¾" x 2¾" to the center of which is welded a spindle, prong, nail, bolt or threaded stud; selection depends upon the material and load to be supported. The perforated base is designed to provide anchorage by bonding it to masonry, metals, wall boards, plaster, tile, glass, etc., with Miracle Anchor Adhesives which are manufactured in many formulations to meet various requirements.

advantages

Zinc coating with a dichromate finish resists corrosion. Eliminates delimination and sagging of glass fiber and soft board types of insulation. Eliminates drilling, welding, expansion bolts. Reduces time construction and insulation costs. No damage to surfaces in event of removal of installation.

features

load capacity: 2" x 2" anchor safety supports 5 lbs/anchor; 2¾" x 2¾" anchor safely supports 10 lbs/anchor.

spacing: approximately 12" on centers, depending upon load requirements.

coverage: one man can install 200 anchors per hour; approximately ¼ of time required for mechanical anchorage.

adhesives for anchors

Anchor Adhesives for temperatures from −40° F to +200° F, RT-1000: from −40° F to +450° F or when asphalt primers or compounds are involved.

installation of anchors

Bonding surfaces must be clean and rigid. Do not bond to cold water points. Apply a walnut sized "blob" of Miracle Anchor Adhesive on anchor base with a putty knife to insure a film of adhesive approximately 1/16" thick after the Anchor will have been firmly pressed into place by a twisting motion to ensure wet adhesive coming into contact with both surfaces. Allow to set for 48 hours at normal room temperature before attaching any load.

direct adhesion

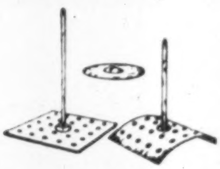
Miracle Adhesives are manufactured in many formulations to suit the direct bonding of insulation materials to metal, brick, concrete, wood, building boards, etc., for on-the-job application.

insulation fastening

anchors

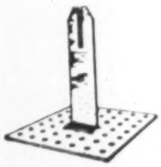
description

spindle anchor and washer



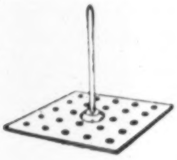
For bonding cork, fiber glass, batts, thermal cellular glass, mineral wool, etc., to ducts, walls and ceilings. Also for support of wire mesh for plaster finish. Lock washer is designed to hold insulation firmly in place thus eliminating delamination of insulation. Curved plate available for attachment to each type of corrugated surface.

pronged anchor



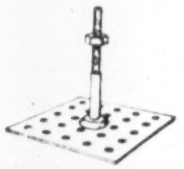
For bonding block insulation such as thermal cellular glass to ducts, walls and ceilings. Pronged Anchors are set between rows of block insulation and prongs bent in reverse direction over blocks. For wire mesh with plaster finish, 1 prong of each Anchor is bent over block insulation, the other prong penetrating mesh, then bent over before applying plaster finish. Alternate type Anchor available for support of small cables, tubing, air lines, etc.

anchor nail



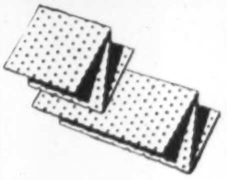
For bonding furring strips to masonry walls for the attachment of wallboard. Also for installing wood floor runners on concrete floors to support 2" solid partitions (½" plaster board plus ¾" plaster both sides). No drilling for mechanical anchorage.

anchor bolt



For attaching cabinets, towel, tissue and other types of dispensers to tile or other rigid surfaces. Also used for attaching plastic, wood or metal letters in glass or masonry. No drilling required.

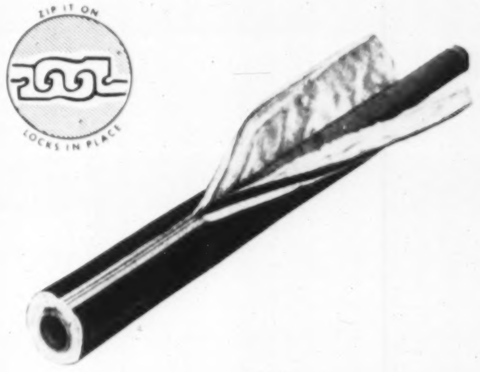
Z-clips



For attaching wallboard, plasterboard, insulation board, etc. to exterior walls when an air space is required. Hinged construction takes up irregularities in surface to which they are bonded. Clips are 2" x 2" or 2" x 4" perforated 20 ga. steel.

PROTEKTO-FLEX

flexible tubing and duct insulation for air conditioning equipment and systems and industrial installations — interior and exterior



An ideal combination of highly efficient fine-fibred Fiberglas® insulating wool and tough plastic vapor barrier jacket, Protekto-Flex offers a scientifically designed insulation for tubing, piping, ducts and equipment that contain chilled water, cold or hot water, cold or hot air, chilled and hot liquids and gases.

The flexibility of both the insulation and the jacketing permits quick installation where carriers are curved, bent, or have irregular surfaces. Even when fittings do occur, Protekto-Flex eliminates entirely the usual slitting and bonding operations. Protekto-Flex readily adjusts itself to bends in tubing, passes over sweated couplings and will take a 90° turn without difficulty.

prevents condensation Installed in a standard thickness, which varies from ½" to ¾", Protekto-Flex will prevent sweating on any line operating as low as 32° F when ambient air conditions do not exceed relative humidities as high as 75% for extended periods.

ease of application With the revolutionary FlexiGrip "zip-on" type of closure, Protekto-Flex can be easily and readily slipped on over the tubing after all lines have been tested out and mechanical work completed. This eliminates any possible interference between various trades working on the installation of complete air conditioning system.

sizes for air conditioning Due to the flexibility of the low density Fiberglas, each size of Protekto-Flex adjusts itself to several sizes of copper tubing. To meet the requirements of the air conditioning industry, the following five standard sizes have been adopted which are available in continuous lengths in standard 50 foot dispensing cartons (longer lengths available):

size number	for copper tubing, inches, OD
1	½ to ¾ — runouts
2	⅞ to 1⅛ — runouts
3	1¼ to 1⅝ — runouts
4	2⅛ to 3⅛ — suction lines
5	3⅝ to 4⅛ — suction lines

few joints The long lengths which are standard with Protekto-Flex make possible a minimum of joints.

colors Steel gray or black are standard; additional colors are available if desired.

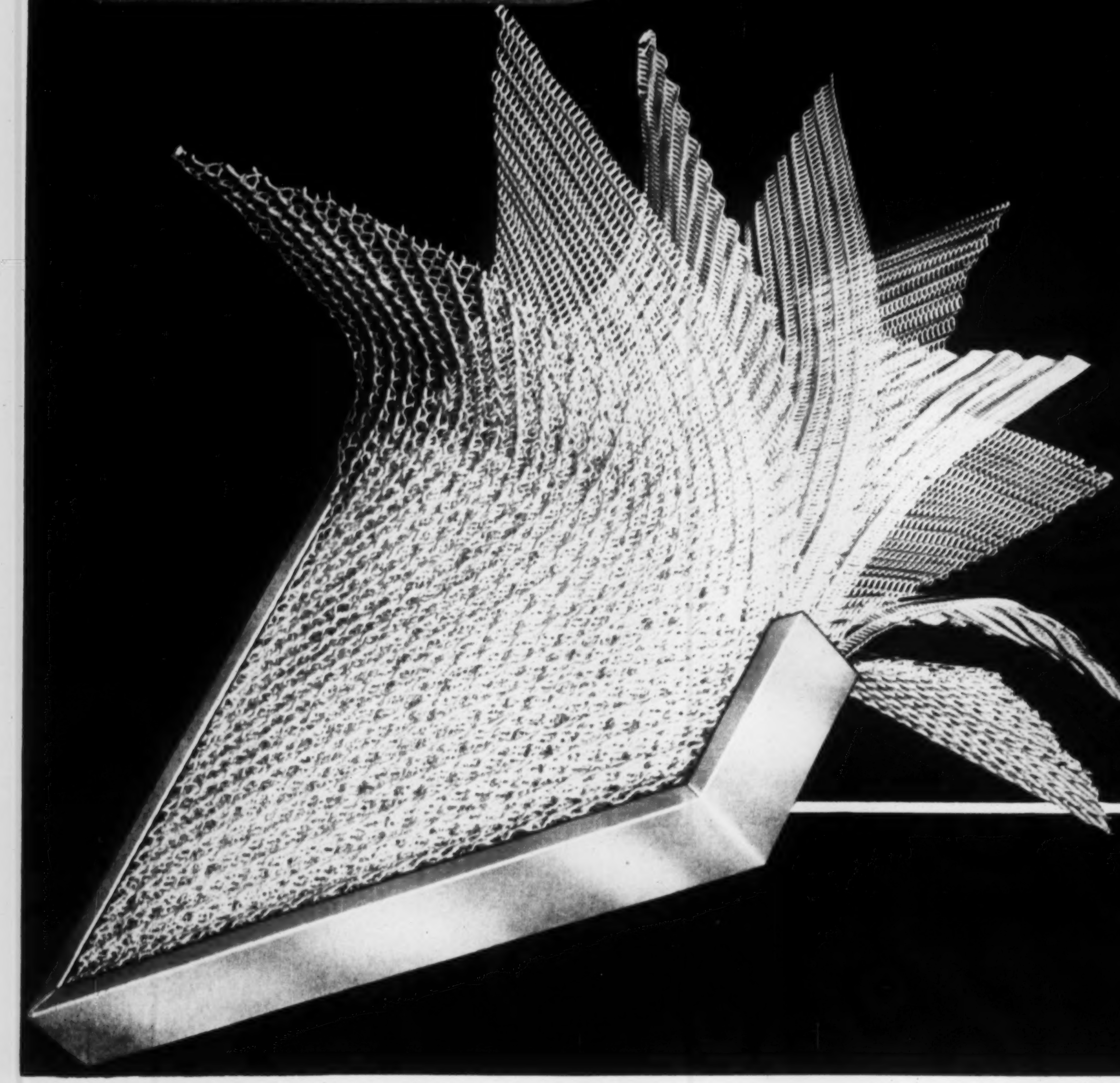
®Registered trade mark of Owens-Corning Fiberglas Corporation

miracle adhesives corporation

214 E. 53 st., New York 22, New York

WE DARE TO DISCUSS LINT *

Evans Lifelong



. . . THE MOST AVOIDED WORD IN AIR FILTERING

AIR FILTERS

*SPECIAL FILTERING ACTION CATCHES AND HOLDS LINT WITHOUT STOPPING AIR FLOW

Make no mistake about it . . . the above statement is not just a claim . . . IT IS AN ABSOLUTE PROVEN FACT. Proven with a test dust that contained 6 times as much lint as that generally accepted for filter testing.

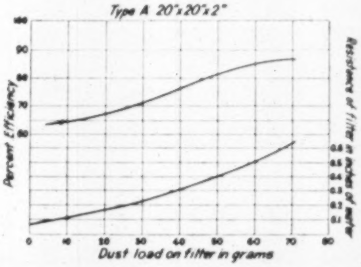
HERE IS THE COMPARISON

GENERALLY ACCEPTED TEST DUST	EVANS TEST* DUST
72% — standardized air cleaner test dust, fine, (Arizona Road Dust, fine)	61% — standardized air cleaner test dust, fine (Arizona Road Dust, fine)
25% — K-1 Carbon Black	21% — K-1 Carbon Black
3% — No. 7 Cotton Linters (percentages by weight)	18% — COTTON LINTERS . . . THESE LINTERS RANGING IN LENGTH FROM 1/8", 1/4", 3/8" and 1/2" WERE ADDED IN EQUAL PORTIONS TO GIVE AN ADDITIONAL 15% LINT TO THE FORMULA.

THIS NEW EVANS FORMULA WAS USED TO PROVIDE A TEST DUST WHICH WOULD BE MORE REALISTIC IN MATCHING EVERY DAY WORKING CONDITIONS.

In addition to using dust with an 18% lint content Evans . . . in order to establish the most grueling possible conditions . . . employed a *continuous feeding process.*

The full amounts of dust were fed into the filter over a period of 2, 3 or 4 hours. (This process was continuous except for a 5 to 10 minute break at the end of each hour which was required to reload dust and fiber feeders.)



THESE EXCLUSIVE EVANS FEATURES MADE THIS PHENOMENAL FILTERING PERFORMANCE POSSIBLE

- PRECISION ANGLED OPENINGS FORCE AIR INTO EXTREMELY HIGH TURBULENCE. CAUSE IT TO TRAVEL 3.5 TIMES DEPTH OF FILTER FROM INLET TO OUTLET SIDE.
- ROUGH, TALONLIKE BURRED EDGES GRIP AND HOLD DIRT AND LINT. FORCE AIR TO TRAVEL OVER 1.24 MILES OF THESE EDGES IN A 20" x 20" x 2" SIZE FILTER.
- NO THICK AND THIN SPOTS. AIR IS PULLED INTO FILTER EQUALLY OVER ENTIRE FILTER PACK SURFACE.
- RIGIDITY OF FILTER PACK ELMINATES ALL FLUTTER.
- LARGE PRECISION CUT OPENINGS ON INLET SIDE HOLD MANY TIMES MORE LINT WITHOUT STOPPING AIR FLOW. UTILIZE FILTER DEPTH.

AMAZING NEW MERCHANDISING POLICY PROTECTS DISTRIBUTORS, JOBBERS, AND DEALERS

Guarantees this protection. Opens an amazing new field in sales and profits.

If you are now handling an old-fashioned line of filters, which is not giving adequate filtering performance, adequate profits, adequate customer satisfaction and adequate territory protection, then get complete Evans story on both the new lifelong filter and the new merchandising policy.

INVESTIGATE NOW! MAIL THIS COUPON TODAY!

THE GEORGE EVANS CORPORATION, MOLINE, ILLINOIS

GENTLEMEN: Please send me: ☐ Descriptive Literature ☐ Merchandising Policy ☐ Price Lists

I WANT TO LEARN MORE ABOUT THIS REVOLUTIONARY NEW FILTER DEVELOPMENT.

NAME COMPANY

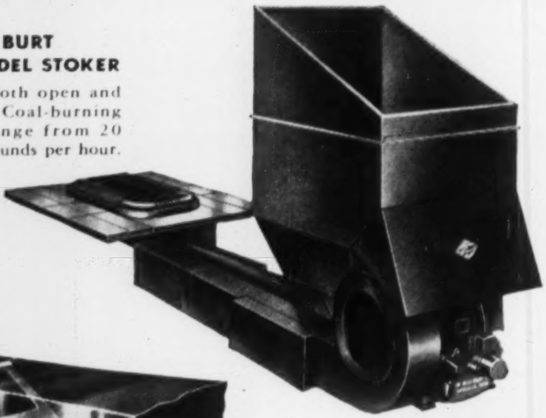
ADDRESS

CITY STATE

SAFE, CLEAN COAL HEAT

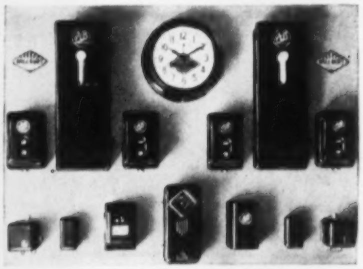
ENGINEERED FOR LOW COST TROUBLE-FREE OPERATION & MAINTENANCE—

Coal fired with a Will-Burt Stoker is the preferred method of heating wherever low-cost installation, clean coal heat and a factor of greater safety are of utmost importance. Will-Burt Stokers are engineered for application to a variety of coal burning boilers and furnaces, providing trouble-free performance, particularly where installations in schools, hospitals, churches, institutions, apartments and factory buildings require relief from maintenance throughout the heating seasons. The Will-Burt patented automatic air control delivers the correct quantities of air for complete efficient combustion during the operating and off periods—providing low-cost, clean coal heat. Prevention of smoke and soot, such as is usually prevalent when the fire is starved for air, is practically eliminated by air automatically induced to meet ever-changing fuel bed conditions.



WILL-BURT HOPPER MODEL STOKER

available in both open and closed hoppers. Coal-burning capacities range from 20 through 750 pounds per hour.



WILL-BURT CONTROL PANEL

Prewired, pretested control panel boards provide an interconnected control system for stokers to be operated by either a common operating and/or individual holdfire control, depending on the setting of the safety switch, off-on switch and timeswitch cycle. Mounting wall brackets are provided.

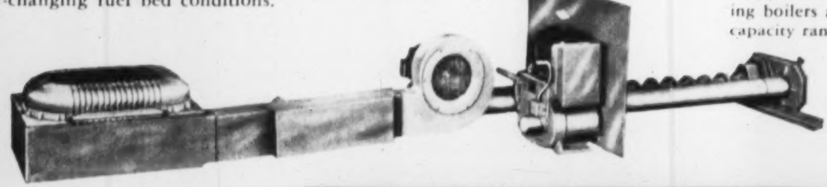
WILL-BURT AUTOMATIC AIR CONTROL

assures the proper combustion of fuel during the operating period as well as during the time the blower and feed screw are off. This patented device prevents a condition of smoke and soot. It allows for dissipation of any intense heat that may be surrounding the tuyeres or dead plate by permitting induction of normal draft to the fire bed. It automatically assures the most efficient combustion of bituminous coal in ever-changing fuel bed conditions.

ALL THESE ADVANTAGES WITH A
WILL-BURT
STOKER

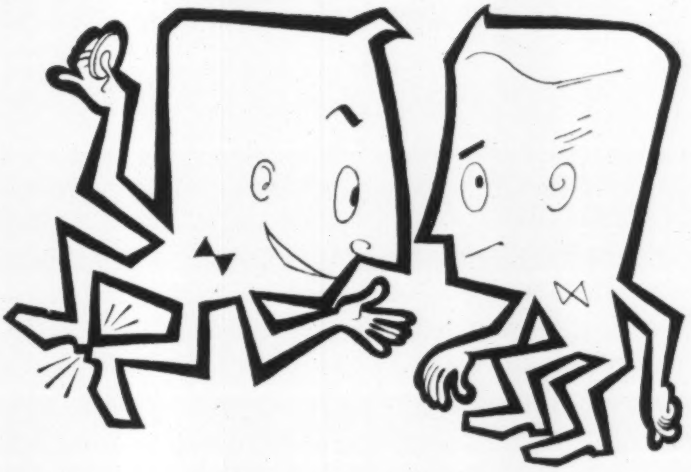
WILL-BURT BIN FED STOKERS

reduce cost of coal handling and maintenance to an all-time low. For application with various types of bituminous coal burning boilers and furnaces, in the same fuel capacity range as hopper models.



Write on your letterhead for the Will-Burt Stoker Data Book, complete with engineering information, dimension and installation drawings, suggested specifications, etc. A valuable reference book, especially for architects and engineers.

The WILL-BURT Company
OVER TWENTY-FIVE YEARS IN THE STOKER BUSINESS
BOX 902 · ORRVILLE, OHIO

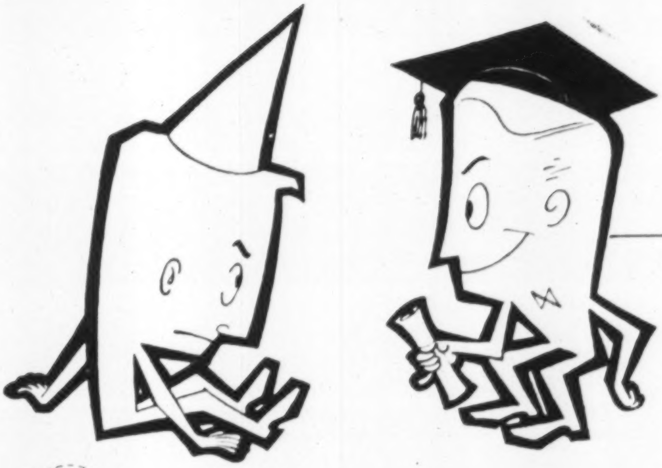


Look! I can buy coal for much less a ton than you're paying.

I used to buy that coal too, but it costs more per million BTU's with a whole lot more in hidden costs.

What do you mean by "hidden costs"?

That coal you're talking about is high in ash. So we were buying ashes at the coal price, paying freight on them from the mine, then paying to have them hauled away. Your "cheaper" coal clinkers; it smokes; it fouls the tubes. That means higher labor costs and higher maintenance. Now I pay more per ton and save thousands of dollars a year.



Coals produced on the C&O are tops in quality.

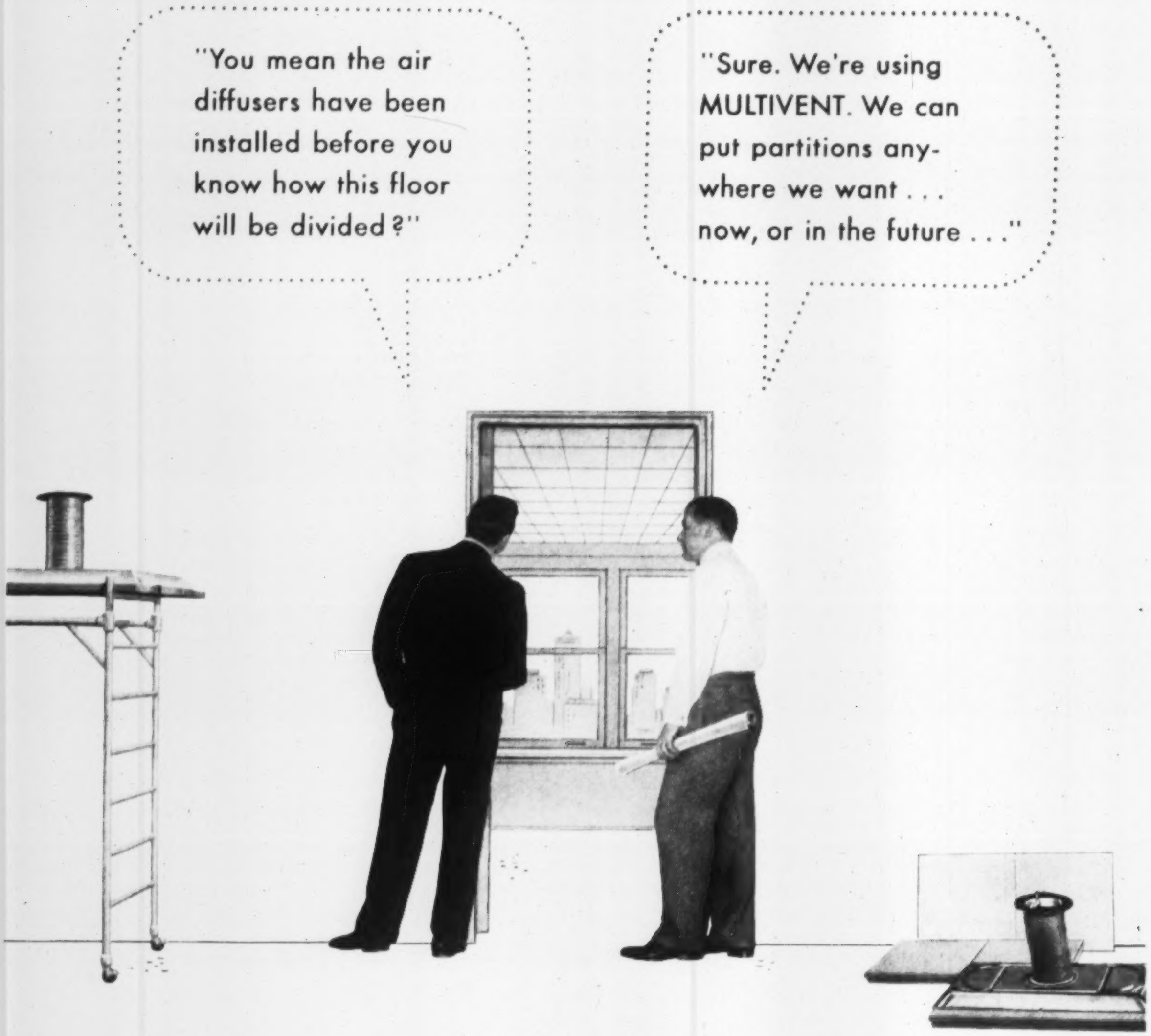
A C&O combustion engineer showed me why this grade of coal would work best in our type of installation and our experience has shown he was right. You'd better get some expert advice. It can save you money, too.

P.S.

There's a lot more to buying coal than the cost per ton. Why not contact coal producers on the C&O to solve your particular fuel requirements, or write to: R. C. Riedinger, General Coal Traffic Manager, Chesapeake and Ohio Railway Company, Terminal Tower, Cleveland 1, Ohio.

Chesapeake and Ohio Railway

WORLD'S LARGEST CARRIER OF BITUMINOUS COAL


"You mean the air diffusers have been installed before you know how this floor will be divided?"
"Sure. We're using MULTIVENT. We can put partitions anywhere we want . . . now, or in the future . . ."

You're free to locate partitioned office space wherever it's needed, when you work with Multi-Vent low velocity air diffusers.

Once installed flush in the ceiling, Multi-Vent air diffusing panels need not be moved, altered in any way, or even adjusted when partitions are put in place—or when they're relocated.

Multi-Vent introduces conditioned air through the perforations in standard acoustical ceiling pans, at low velocity. The air is gently diffused downward into the room. There is no "throw" or "blow" to bounce off nearby partitions.

A partition may actually bisect a Multi-Vent panel, without affecting comfort conditions in the surrounding area. Ceiling symmetry is never a problem; Multi-Vent is completely concealed.

Write for detailed literature and name of representative in your area.

multi-vent

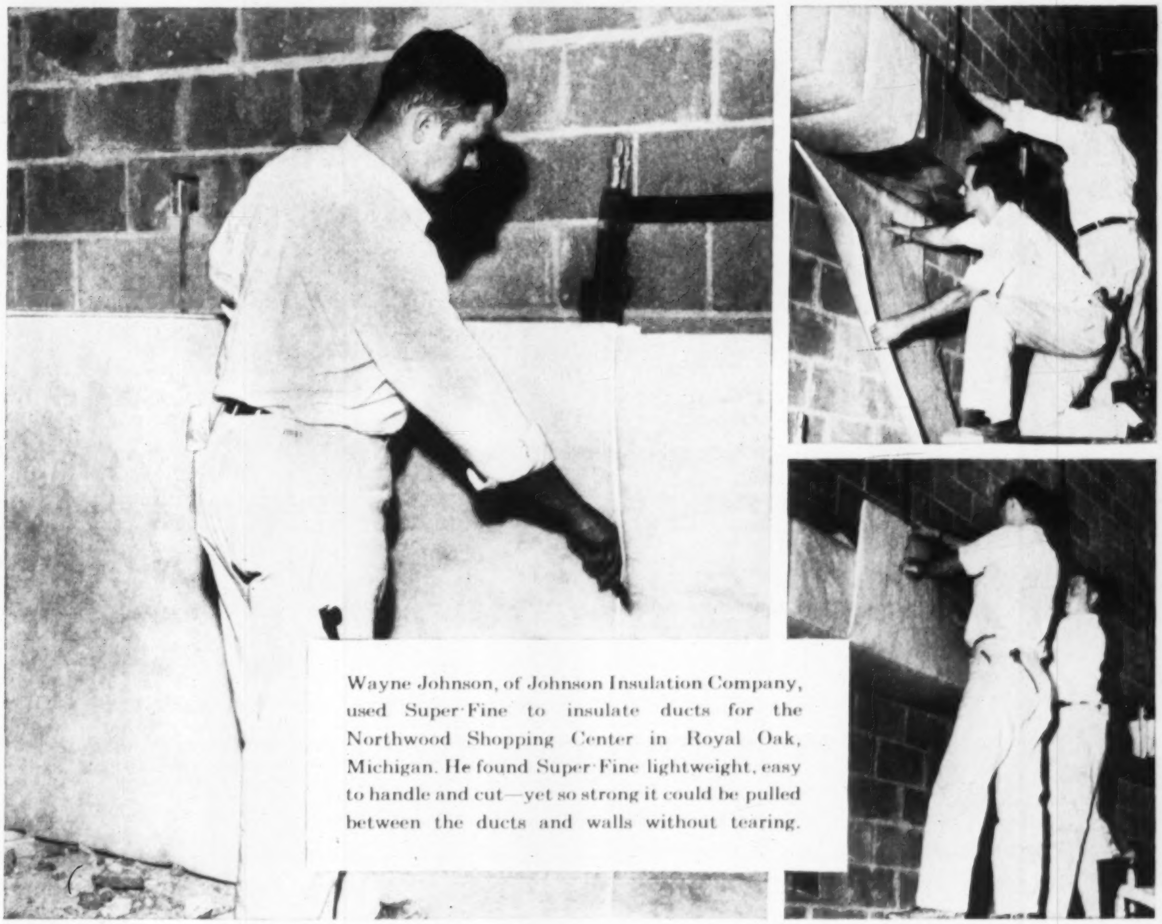
DIVISION OF THE PYLE-NATIONAL COMPANY

1373 N. Kostner Avenue, Chicago 51, Illinois

WHERE QUALITY IS TRADITIONAL

SALES AND ENGINEERING REPRESENTATIVES IN PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

INSULATION news from L·O·F GLASS FIBERS COMPANY



Wayne Johnson, of Johnson Insulation Company, used Super·Fine to insulate ducts for the Northwood Shopping Center in Royal Oak, Michigan. He found Super·Fine lightweight, easy to handle and cut—yet so strong it could be pulled between the ducts and walls without tearing.

Super·Fine's low installation cost means big business for contractors!

Fast installation combined with high insulating efficiency can clinch the contract for you.

Super·Fine's millions of fine glass fibers form countless dead air cells which provide highly efficient insulation. It is pleasant to handle—fast and easy to apply. It cuts readily with an ordinary knife, needs no special measuring or fitting, can quickly be wrapped around ducts and supporting hangers. Contractors find that workmen can apply more Super·Fine per day than other types of insulation.

You save on storage space, too, because Super·Fine comes in compressed rolls up to 72″ wide, in all standard thicknesses and roll lengths. They take up less space, yet the insulation springs back to full thickness when unrolled.

There's big business ahead for you when you discover how Super·Fine can help you save on duct-application costs. Check your Yellow Pages for the nearest distributor or write: L·O·F Glass Fibers Company, Dept. 39-16, 1810 Madison Avenue, Toledo 1, Ohio.

LOF
GLASS FIBERS
SUPER·FINE
INSULATION

L·O·F GLASS FIBERS COMPANY

TOLEDO 1, OHIO

Makers of glass fibers by the exclusive "Electronic Extrusion" process

these "Extras" in CHICAGO PUMPS

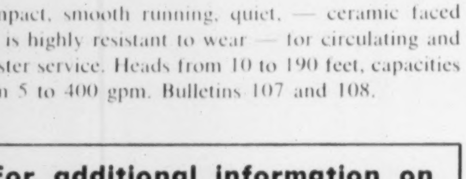
mean
Longer, Better Performance
Lower Cost Operation
and Installation

Extra
POSITIVE
CLOG-PROOF
SEWAGE
HANDLING

FLUSH-KLEEN Sewage Ejector TYPE "S"

The Flush-Kleen Sewage Ejector can't clog because only liquid is handled by the impeller. Coarse matter is strained out, then backwashed from the strainer into discharge pipes. No strainer baskets to clean, no repairs due to clogging, no foul basins because solids never reach the wet basin. Besides being easier to maintain, Flush-Kleens last longer and require less power. Write for details in Bulletin 122C.

A COMPLETE LINE FOR EVERY BUILDING SERVICE



NEW F-C AND C-C PUMPS EITHER FLEXIBLE-COUPLED OR CLOSE-COUPLED

Compact, smooth running, quiet, — ceramic faced seal is highly resistant to wear — for circulating and booster service. Heads from 10 to 190 feet, capacities from 5 to 400 gpm. Bulletins 107 and 108.

For additional information on any of the above pumps, specify by bulletin number.

Extra - PROVED
SERVICE
RECORD
CHICAGO
PUMP CO.

DOUBLE SUCTION HORIZONTALLY SPLIT CASE PUMP

Accurately machined and fitted revolving parts in carefully cast casing. Have proved reliable for house pump, circulating and booster service. See Bulletin 101.

Extra - LOW
INSTALLATION
COST
CHICAGO PUMP CO.

TYPE AVC CONDENSATION PUMP AND RECEIVER

Low inlet — no elaborate foundation needed for installation — for systems to 10,000 EDR and 10-30 psi. See Bulletin 245.

Extra - WON'T
STEAM-BIND

SURE-RETURN CONDENSATION PUMP AND RECEIVER

Low inlet — positive head on suction — no friction in manifold between pump and receiver — handles extremely hot condensate without steam binding — for systems to 75,000 EDR and low or medium pressures. See Bulletin 250.

Write to Department B

CHICAGO PUMP COMPANY
Subsidiary of Food Machinery and Chemical Corporation
BUILDING PUMP DIVISION
622 DIVERSEY PARKWAY • CHICAGO 14, ILLINOIS

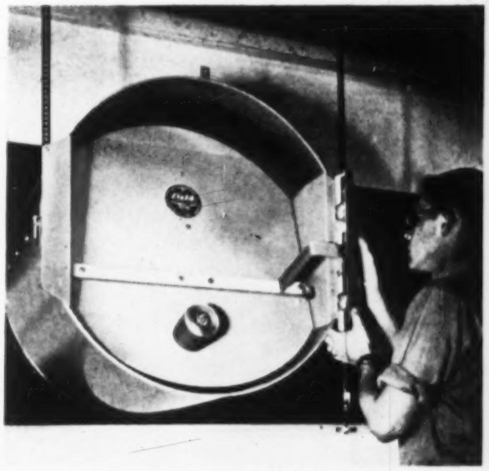
Condo-Vac ®, Sure Return ®, AVC, LVC, Fire, House & Circulating Pumps, Pneumatic & Tankless Water Systems . . Flush Kleen ® Sewage Ejectors, Little Giant ® & Non-Clog Bilge Pumps, Pumps for every Industrial use.

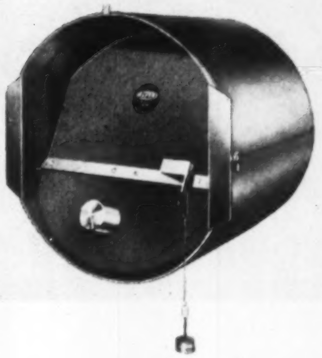
DEPENDABLE, PRECISELY ACCURATE

Draft Control

for coal fired, oil fired, gas fired or gas-oil fired

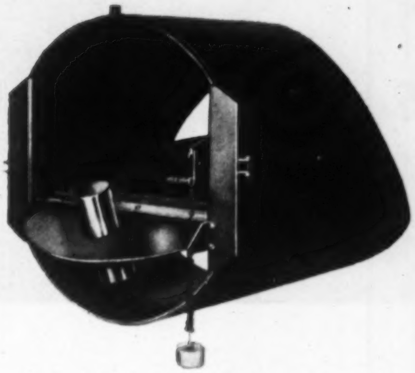
HEATING PLANTS





FIELD TYPE "M" for coal and oil fired heating plants

Heavy duty commercial model in 28" and 32" sizes. Heavy, rigid construction assures long, trouble free service. Stainless steel knife edge bearing for permanent sensitivity. Also available in 6" through 24" sizes for domestic and commercial installations. First choice of heating men — the round control you can level on any flue.



FIELD TYPE "MG" for gas and gas-oil fired heating plants

A heavy duty, precision built control in sizes 8" through 32" for commercial and industrial installations. Stainless steel knife edge bearings for permanent sensitivity. Gate opens inward to regulate updrafts, and outward to relieve down-drafts. Optional safety switch available where codes require. Fully proven, accepted virtually everywhere.

They're real HEAVYWEIGHTS

Compare the weight of a Field Control to any other available. Here is proof of the massive, welded construction, long, vibration-free service, that permits Field's supreme accuracy.

Size Control	Thickness of Parts Gate	Side Plates	Ring	Collar	Wt. without Crtn. or Crate
14 M	16 Ga.	16 Ga.	3/16 x 2"	22 Ga. Galv.	19#
16 M&MG	16 Ga.	16 Ga.	3/16 x 2"	18 Ga. Galv.	28#
18 M	16 Ga.	16 Ga.	3/16 x 2"	18 Ga. Galv.	35#
20 M&MG	16 Ga.	16 Ga.	1/4 x 2"	18 Ga. Galv.	41#
24 M&MG	14 Ga.	16 Ga.	1/4 x 2"	18 Ga. Galv.	65#
28 M&MG	14 Ga.	14 Ga.	1/4 x 4"	14 Ga. H.R.S.	110#
32 M&MG	14 Ga.	14 Ga.	1/4 x 4"	14 Ga. H.R.S.	140#

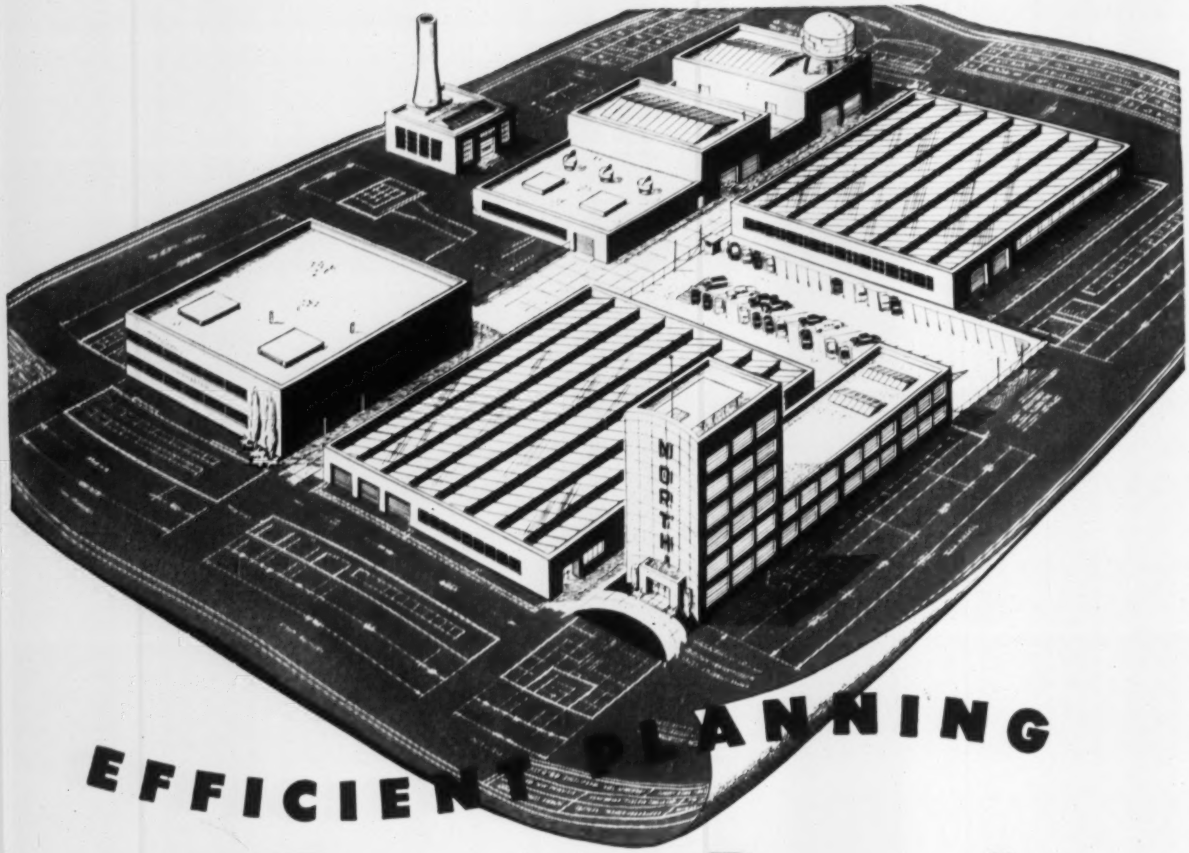
field

FIELD CONTROL DIVISION

of H. D. CONKEY & COMPANY, Mendota, Ill.

Affiliates

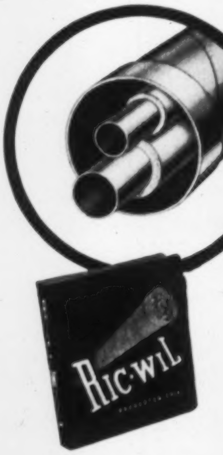
Conco Building Products, Inc. • Brick, Tile, Stone
Conco Materials Handling Division • Cranes, Hoists



EFFICIENT PLANNING

Starts with RIC·WIL

● Early planning with a RIC-WIL field representative on central heating or air conditioning systems will mean less work later on. Custom engineering and prefabrication of RIC-WIL units offer quick, efficient installation. RIC-WIL's engineering service with forty-five years experience in the Insulated Piping Field is available for *early* planning and consultation.



Write or phone your nearest representative or send for the illustrated RIC-WIL catalog.

Quality Piping Systems . . .
. . . of Exceptionally High Thermal Efficiency

RIC·WIL INCORPORATED

PREFABRICATED INSULATED PIPING SYSTEMS

BARBERTON, OHIO

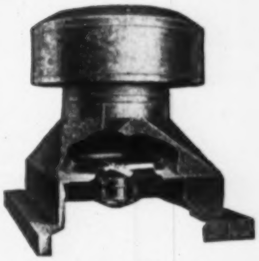
Swartwout Roof Ventilators

for every industrial, commercial and institutional need

The Swartwout Line of gravity and powered roof ventilators and ventilating louvers provides a wide range of facilities for handling vitally necessary ventilation. Experienced engineers are at your service to assist in the proper solution of your building interior atmospheric problems.

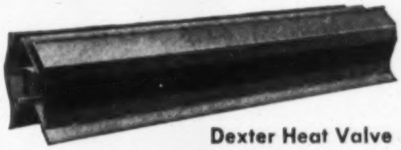
Write for our Guide for Estimating Ventilation Requirements (Form 245), which will help you determine ventilation needs in your plant.

Gravity Valvent



Powered Valvent

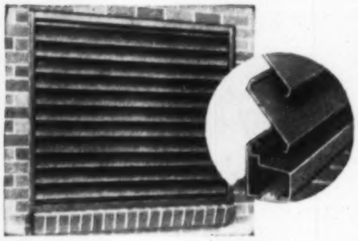
Rotary



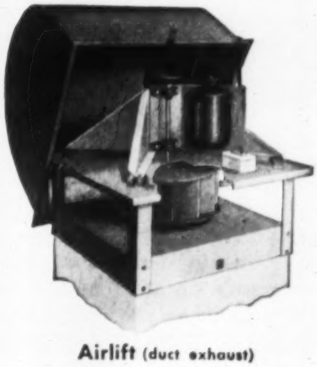
Dexter Heat Valve

Airjector

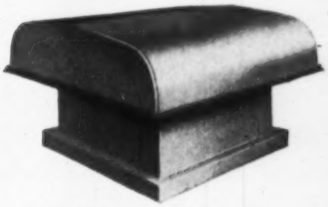
Airmover



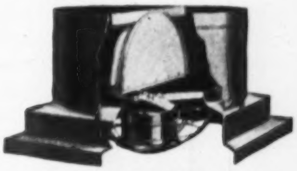
Louvers Swartwout Airlouvers are weathertight. Overlapping blades, fixed or adjustable. Unusual size range — fill any opening with equal size louver units.



Airlift (duct exhaust)



Low Line — Gravity & Powered



Whirlout

Fire Ventilation

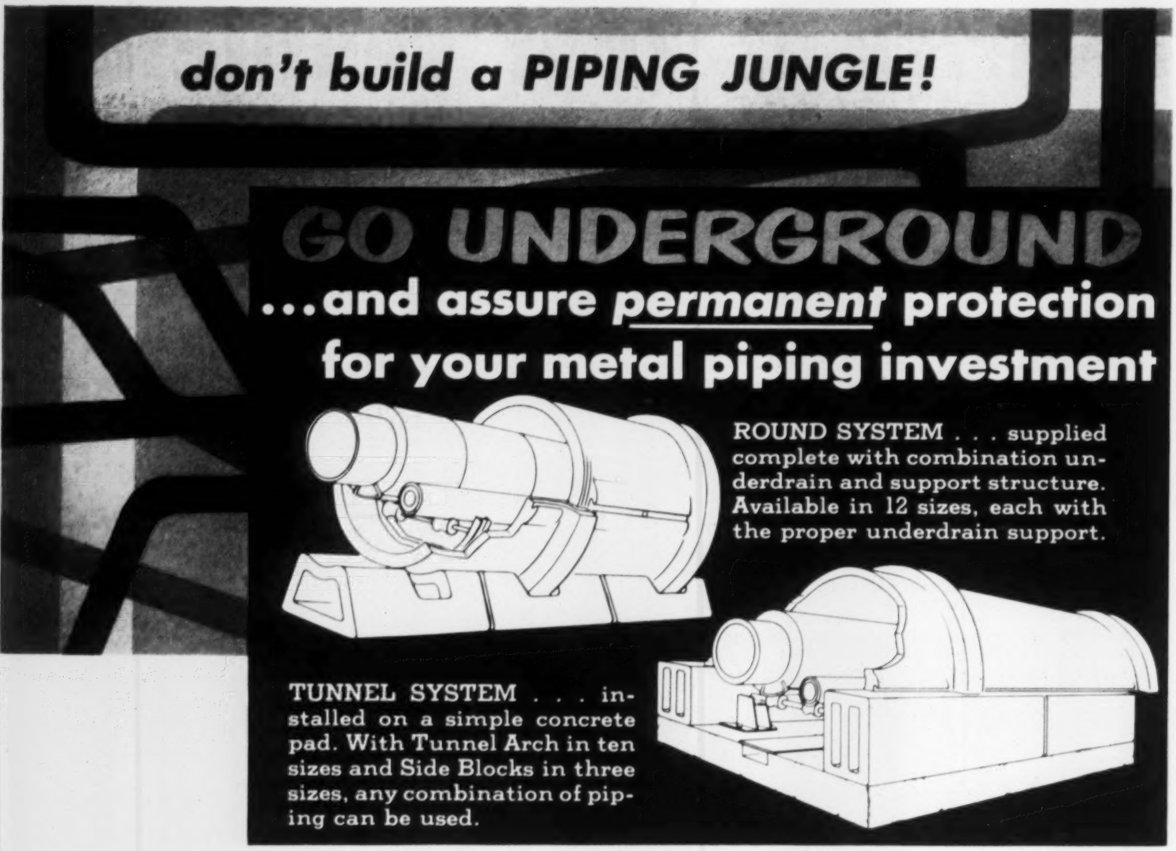
Swartwout Fire Valve is designed to quickly release smoke, heat and fumes in case of fire, helping to prevent fire spread. It is an approved type of heat release for school and theater stages. Each unit provides 46 sq. ft. free opening. Weatherproof when closed.

Fire Valve

Swartwout

Industrial Ventilating Specialists

THE SWARTWOUT COMPANY • 18511 Euclid Ave., Cleveland 12, Ohio



don't build a PIPING JUNGLE!

GO UNDERGROUND

...and assure *permanent* protection for your metal piping investment

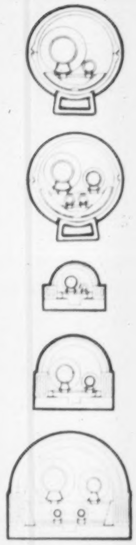
ROUND SYSTEM . . . supplied complete with combination underdrain and support structure. Available in 12 sizes, each with the proper underdrain support.

TUNNEL SYSTEM . . . installed on a simple concrete pad. With Tunnel Arch in ten sizes and Side Blocks in three sizes, any combination of piping can be used.

STILLWATER CONDUIT SYSTEMS

There's one material that never wears out underground. That's vitrified clay. And vitrified clay is the major component of Stillwater Conduit Systems—both Tunnel and Round types. When you run your service piping underground, through Stillwater Conduit, you not only eliminate unsightly jungles of overhead pipe . . . you protect that piping permanently . . . and you lay it straight and true, with fewer "runarounds" to avoid obstacles, and fewer fittings that cause turbulence and pressure drop.

Stillwater Conduit Systems are completely unaffected by extremes of temperature or moisture, or the attack of corrosive soils and ground waters. They provide the *best possible* protection for the enclosed metal service piping. We'll give you all the engineering help you need to design the complete system—and we'll follow through by supervising the actual construction job. Large warehouse stocks assure prompt shipment of any size order, complete with all accessories.



Any combination of service piping can be accommodated by Stillwater Conduit Systems, using either filler or sectional insulation.

WRITE FOR *new four-page, file-size bulletin, with full details*

STILLWATER CONDUIT DIVISION
3334 PROSPECT AVENUE, CLEVELAND 15, O.

STILLWATER CONDUIT SYSTEMS

SW-156-52

Skidmore Pumps

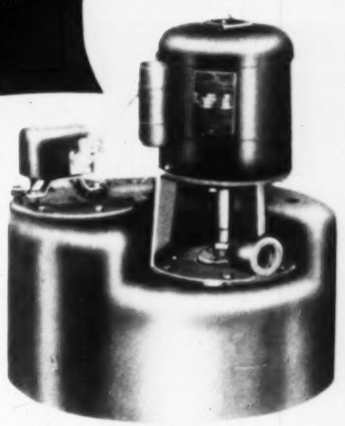
Here are the answers to— your Heating Pump Problems

- Available in capacity range from 500 to 10,000 sq. ft. E.D.R. and discharge pressures from 10 to 40 lbs.

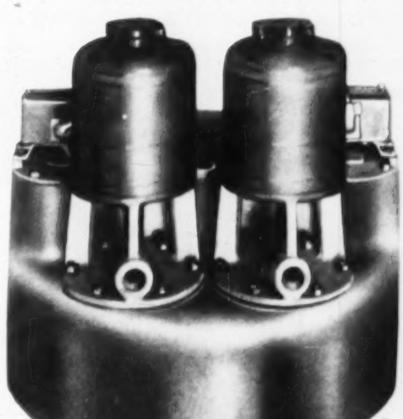
Announcing!

NEW TYPE CVS

This New Skidmore CVS Condensate Pump more than meets the requirements of the industry. Quality constructed throughout . . . offering a greater range of discharge pressures—from 10 to 40 lbs. Featuring—mechanical shaft seal — eliminating any possible leakage from pump shaft. New unit still retains the former compact design, plus lightweight construction. Pump can be installed in limited space . . . on floor level or in pit . . . easily inspected without disturbing piping. Duplex unit is furnished with either two float switches or automatic alternator. Pumps are completely assembled at factory and ready for shipment. Contact your nearest Skidmore Representative or write for bulletin No. 21-B.



SINGLE UNIT—CONDENSATE PUMP



DUPLEX UNIT—TWO FLOAT SWITCHES

MORE FAMOUS SKIDMORE PUMPS →

SKIDMORE VERTICAL TYPE "CVS" CONDENSATION PUMPS

SKIDMORE PUMPS have set a standard for performance and dependability since 1921.

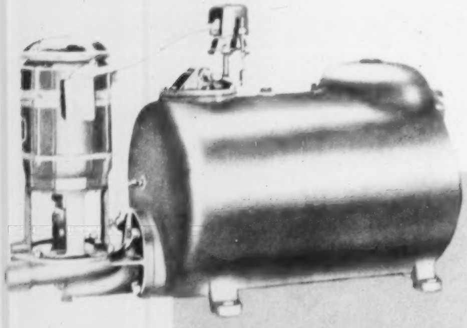
Skidmore Heating Pumps are
designed in both single and duplex units

Write for bulletins

SKIDMORE CORPORATION

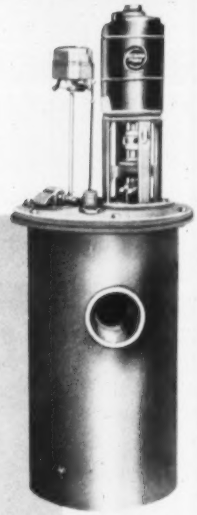
ST. JOSEPH, MICHIGAN

MAINTAINED
SKIDMORE
PUMPS
EFFICIENCY



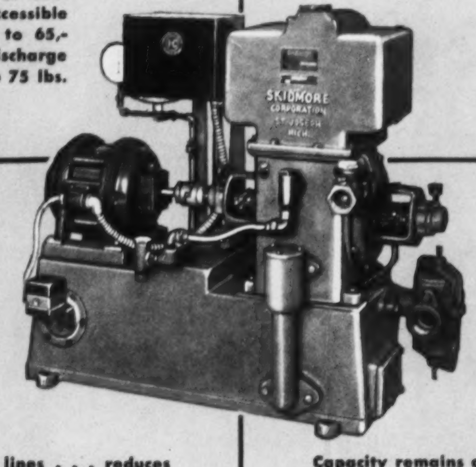
TYPE "VC" PUMP

This Skidmore Condensate Pump is sturdy cast iron construction—low inlet connection — easily accessible — capacities, 1,000 to 65,000 sq. ft. E.D.R. discharge pressures from 10 to 75 lbs.



TYPE "UV" PUMP

Designed for low return installations — pump is bolted to sump type receiver—capacities, 2,000 to 40,000 sq. ft. E.D.R. and discharge pressures from 10 to 75 lbs.



SKIDMORE VACUUM PUMP—SINGLE UNIT

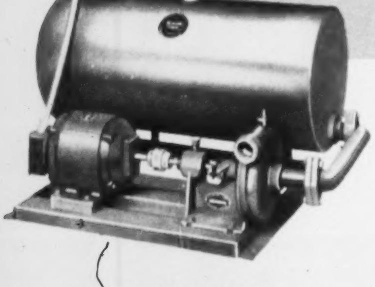
(ALSO **FURNISHED IN DUPLEX**)

MAINTAINED EFFICIENCY

. . . automatically adjusts itself to the varying conditions.

Low return lines . . . reduces installation cost, often eliminating the necessity of a pit.

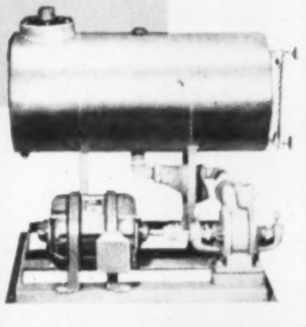
Capacity remains constant year after year . . . eliminates adjustments and costly repairs.



TYPE "HS" PUMP

Sturdily constructed for dependable service at small investment —capacities, 1,000 to 65,000 sq. ft. E.D.R. discharge pressures from 10 to 75 lbs.

SKIDMORE
PUMPS



TYPE "TM" PUMP

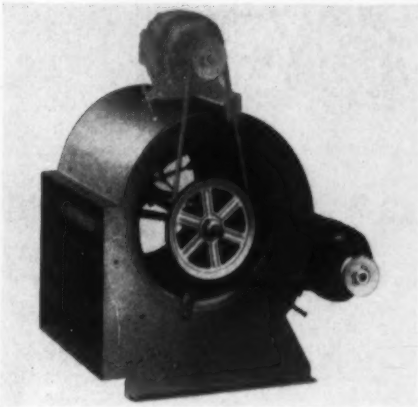
Completely assembled on either steel or cast iron base — capacities, for boilers up to 250 H.P. discharge pressures to 150 lbs.

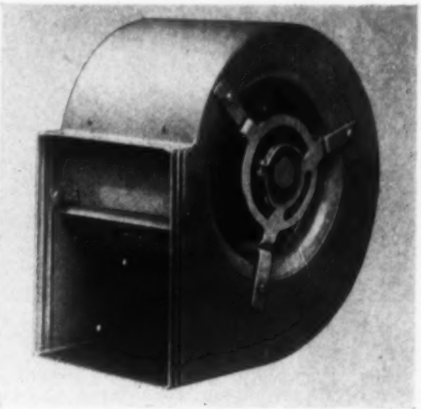
1. Direct Drive or Belt Driven

2. Complete Assemblies or Component Parts

In either case, leading original equipment manufacturers know from experience that

MORRISON BLOWERS...





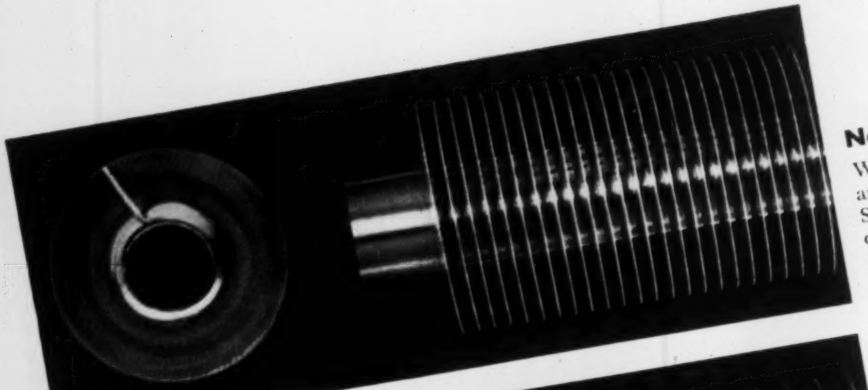
. . . Are dependably "top quality" in construction and service.

Morrison Blowers are correctly designed for your individual space requirements, meeting or exceeding all standards for the industry. They are rugged in construction — quiet in operation.

The wheels are double width, double inlet, standard diameter. Blades are one piece construction.

Ask us how many O.E.M'S are saving 50% of their Blower dollar investment.
New Blower catalogs now available.

MORRISON PRODUCTS INC.
16816 Waterloo Road • Cleveland 10, Ohio



New Smooth Fins

Wide base provides ample contact surface. Smooth fins can be closely spaced without increasing resistance.

Old Type Fins

Crimped to provide necessary contact surface, widely spaced to reduce air friction.

NEW *Smooth-Fin* Aerofin Coils

for Greater Capacity— Lower Resistance

Aerofin extended-surface heating and cooling coils now offer you an even greater area of effective surface — even greater capacity — per square foot of face area. Airway resistance is lowered; higher air velocities can be used. The result is extremely high heating or cooling capacity in a given space.

Compact, sturdy, standardized encased units arranged for simple, quick, economical installation.

Write for Bulletin S-55

The new Aerofin smooth fins are tapered, with wide base that conducts sufficient heat between fin and tube to make the entire fin effective transfer surface.

AEROFIN CORPORATION

101 Greenway Ave., Syracuse 3, N. Y.

Aerofin is sold only by manufacturers of fan system apparatus. List on request.

SIL-FOS goes in for life!

Design and construction under supervision of the Department of Public Works.
COMMISSIONER: Frederick H. Zurmuhlen, P.E., R.A.
ARCHITECT: La Pierre, Litchfield & Partners
GENERAL CONTRACTORS: Castagne & Son
PLUMBING CONTRACTOR: Jarcho Bros., Inc.

Important new buildings in the news, point up the steadily growing swing to silver brazing of non-ferrous pipe and tubing systems with the low-temperature silver brazing alloy, SIL-FOS.

The swing is bound to continue, because the advantages of SIL-FOS brazing are decisive... the tremendous savings in weight and cost of pipe through the use of light-weight tubing... the big savings in assembly time and labor through elimination of threading... the fact that a SIL-FOS brazed installation is permanently leak-tight and maintenance free... and many more!

An example of the swing is the new *"City Prison and Remand Center"* in Brooklyn which has 3 hot water and 2 cold water systems of non-ferrous tubing—all brazed with SIL-FOS.

View of SIL-FOS brazed water lines in laundry—180° hot water and companion circulating lines and 6" cold water lines.

6" cold water downfeed to cells—6" cold water pump line from cellar to roof tank—5" cold water line to boiler in cellar.

In foreground—5" down supply to hot water boiler in cellar and 8" cold water lines to cells. In background—same lines to twin tank on roof.

6" line capped for pressure tests with piece of tubing butt brazed with SIL-FOS. At photo time this plate had been under 110-lb. pressure for 3 months.

GET SIL-FOS BRAZING FACTS—NOW

There's a specially trained SIL-FOS Distributor near you, ready and able to give you the full information about SIL-FOS brazing—as well as prompt supply and helpful service. Our **"Distributor List"** will tell you **who** and **where** he is. With it we'll send you SIL-FOS literature. Write for the list today.

HANDY & HARMAN
FOUNDED 1867
QUALITY · SERVICE
ORIGINATORS OF EASY-FLO & SIL-FOS

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General Offices: 82 Fulton St., New York 38, N. Y.
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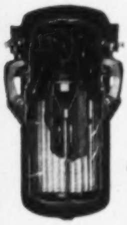
LOS ANGELES, CALIF.
TORONTO, CANADA
MONTREAL, CANADA

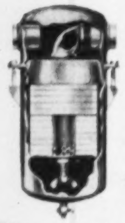
STAYNEW® FILTERS

Dollinger makes ALL TYPES of filters as shown on this page, plus special filters for unusual filtration problems. New users of one specific type of Staynew filters often find a second Dollinger filter performs a great, added service in other processes or operations. Perhaps we can serve major or other filtration needs of your plant.

PIPE LINE FILTERS

Model CPH
Pipe Line Filter
Bulletin 200

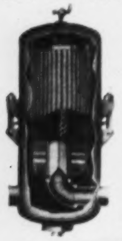

Model CVH (Vacuum)
Pipe Line Filter
Bulletin 200


Model AAPHS
(Absorption)
Pipe Line Filter
Bulletin 200

Model HPH and AHPH
(High Pressure)
Pipe Line Filter
Bulletin 200

LIQUID FILTERS

Model HE (Sump)
Liquid Filter
Bulletin 330

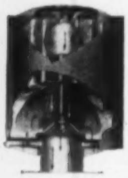

Model ELS (Pressure)
Liquid Filter
Bulletin 300

all types of FILTERS for every INDUSTRIAL NEED

AIR INTAKE FILTERS

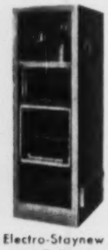
Model IDR
(Ground Level)
Air Intake Filter
Bulletin 100

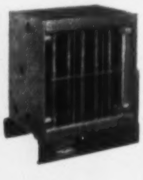
Model DS (Silencer)
Air Intake Filter
Bulletin 100


Model D (Outdoor)
Air Intake Filter
Bulletin 100

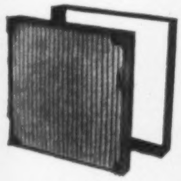
Model C (Indoor)
Air Intake Filter
Bulletin 100

VENTILATION FILTERS


Electro-Staynew
Mist Collector
Bulletin 420


Electro-Staynew
Precipitator
Bulletin 400

Automatic
Ventilation Filter
Bulletin 500

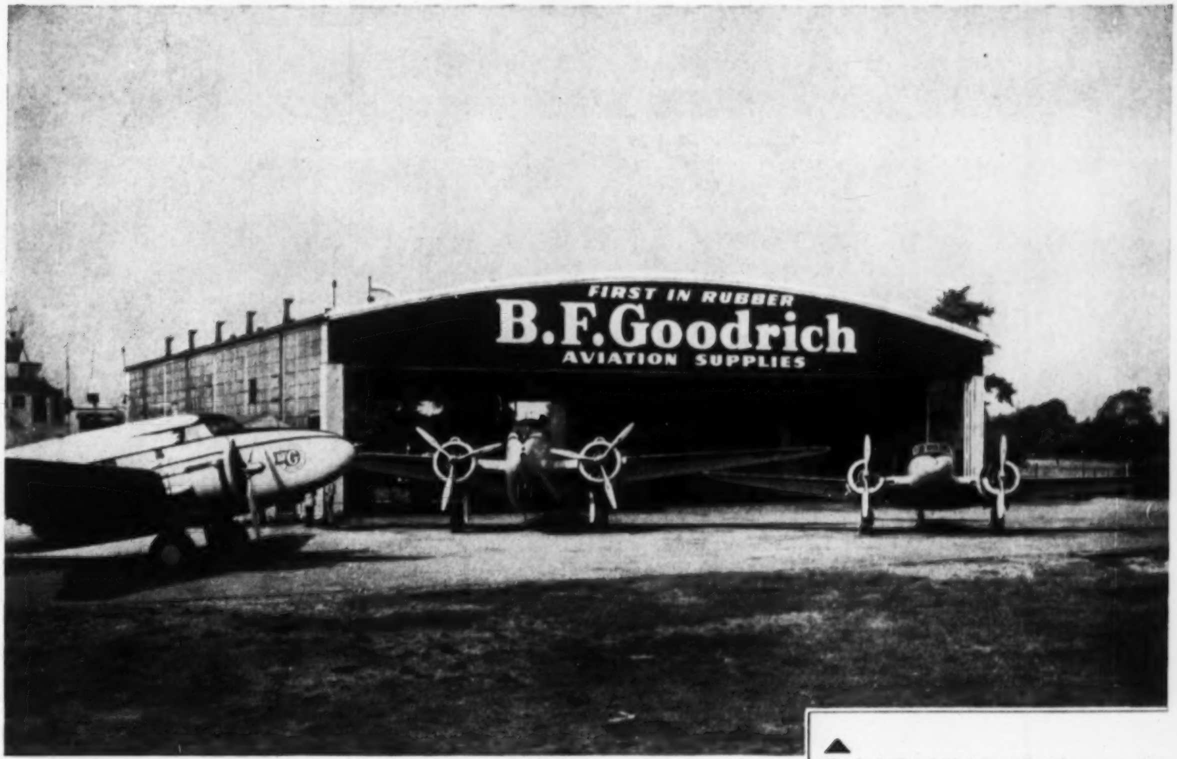

Dry and
Viscous Panel
Ventilation Filters
Bulletin 600 and 700

DOLLINGER
PROTECTOMOTOR
STAYNEW FILTERS

DOLLINGER CORPORATION
CENTRE PK
ROCHESTER 3, N.Y.

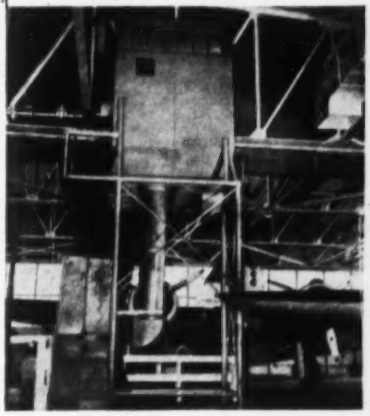
Write, using Bulletin Numbers, for complete information on any of the Staynew filters illustrated. Consult Dollinger engineers on any special filtration problems—no obligation. Dept. 9 Centre Park, Rochester.

LIQUID FILTERS, PIPELINE FILTERS, INTAKE FILTERS, HYDRAULIC FILTERS, ELECTROSTATIC FILTERS, DRY PANEL FILTERS, VISCOUS PANEL FILTERS, LOW PRESSURE FILTERS, HIGH PRESSURE FILTERS, AUTOMATIC VENTILATION FILTERS, NATURAL GAS FILTERS, SPECIAL DESIGN FILTERS, SILENCER FILTERS



▲ The B. F. Goodrich hangar is a busy one. At least 10 planes move in and out of it daily, making heat retention extremely difficult.

Mounted 14 feet above the working area, this Dravo Counterflo permits mechanics to "work with gloves off." Vertical duct is used to "target" heat to plane engines. ▼



How to heat a hard-to-heat hangar... and cut fuel $600 below estimates

Probably no other type of structure is as hard-to-heat as the aircraft hangar. With their full-width hangar doors frequently opened for incoming and outgoing planes, heat loss is practically complete within a matter of minutes. This was the major problem B. F. Goodrich faced in attempting to heat their Akron, Ohio, flight hangar.

To further complicate this problem, B. F. Goodrich's hangar was not designed for wintertime use. Built in the days when little cold weather flying was done, more than 80% of the wall area is glass. As wintertime flights and use of the hangar increased, B. F. Goodrich tried a number of different heating systems. First they tried a central system. This failed, so several wall-type heaters were used. But fuel bills were high, and temperatures remained uncomfortably low. Engine warm-up time took as long as 1½ hours.

Then B. F. Goodrich made a comprehensive study of their problem. Result was the installation of a 2,000,000 Btu per hour Dravo *Counterflo* Heater. Here's what happened.

In the over-all shop area of the 100 x 140 ft. structure, the Dravo Heater maintains a comfortable 60-degree temperature. Mechanics now work "with gloves off." Mr. James Ball, manager of the airport facilities, says that even when the hangar's full-width doors are opened for plane traffic, "within 15 or 20 minutes' time we have the shop back to 60 degrees." Also by "targeting" warm air from the heater to plane engines, B. F. Goodrich drastically cut warm-up time to a maximum of 20 minutes. Most outstanding, however, is the fact that *heater fuel bills during its first season of service were $600 lower than B. F. Goodrich engineers had anticipated.*

Many records like this prove that even under adverse conditions, Dravo units always deliver instantaneous, economical heat. Send the coupon below and you'll find out how and why Dravo can quickly end your heating problems!

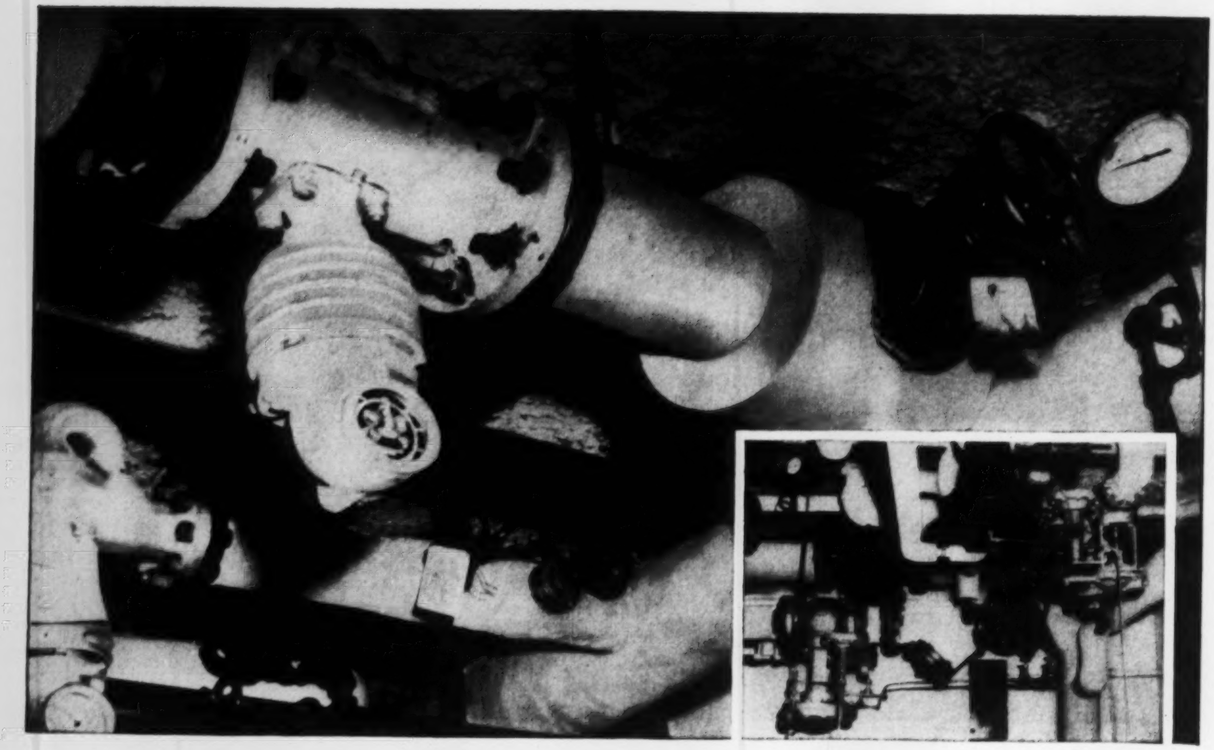
Dravo Corporation, Department A-1401
Fifth & Liberty Avenues
Pittsburgh 22, Pa.

I am interested in Dravo Heaters for ______________

☐ Please send literature
☐ Please have representative call

Name ______________
Company ______________
Address ______________
City ______________ Zone ______ State ______

DRAVO
CORPORATION
Pittsburgh 22, Pennsylvania
Representatives in principal cities



FOUND NEW STEAM REVENUES BY A DISTRICT HEATING COMPANY!

In February of this year, *Builders Dual Ranging Shuntflo Meters* "put the finger" on 206,000 pounds of steam which otherwise would have gone unmetered at a major housing project. These Meters produced $267.80 of additional steam revenue in one month alone for the district heating company.

This is typical of what can be expected from this low cost metering system. Using Dual Ranging Shuntflo Meters with Squires Pressure Reducing and Regulating Valves, district heating companies and industries can now recover the bottom 10% of steam consumption now going unmetered. Here's an investment that pays for itself in a matter of months – the quickest and easiest way to gain new steam revenues without increasing steam rates. This system can also be supplied for dual metering of gas or air.

We will gladly send you technical reprint REF. No. 100-K29, giving complete details on this money-making system. Write, today, to Builders-Providence, Inc., 381 Harris Avenue, Providence 1, Rhode Island.

BUILDERS-PROVIDENCE
DIVISION OF B-I-F INDUSTRIES, INC.
BUILDERS IRON FOUNDRY • PROPORTIONEERS, INC. • OMEGA MACHINE CO.

B-I-F
METERS
FEEDERS
CONTROLS

Refinery proving ground confirms superiority of Triple-Zone Gilsulate for hot underground pipes

> *"...pipes looked absolutely new...insulating efficiency equal to or better than any other...cost of the* GILSULATE *system has been appreciably lower."*
>
> —R. W. AYER, Chief Engineer, Salt Lake Refining Company

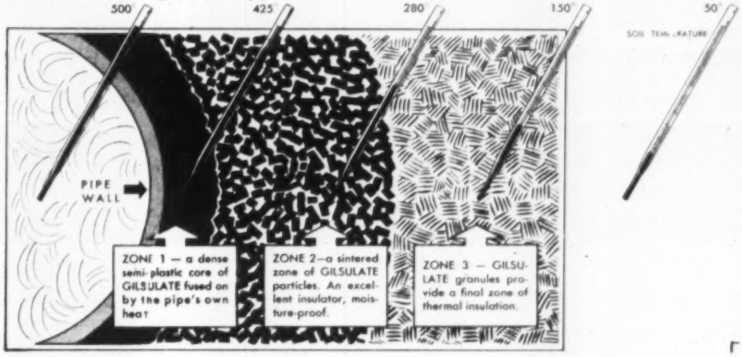
Salt Lake Refining Company confirms the findings of hundreds of GILSULATE® installations throughout the country: this *triple-zone insulation* succeeds where others have not fulfilled all operating conditions—*and at lowest cost per installed linear foot.*

Research excavation of the initial GILSULATE installation at Salt Lake Refining Company, after 14 months of service, proved to their engineering and maintenance staff that this new insulation functioned at peak efficiency. Both lines—one of steam, one of water—were in excellent condition, with no evidence of pitting or scaling. Additional GILSULATE installations have been made since by the company for utility services and for road crossings. The insulating efficiency, according to their chief engineer, is "equal to or better" than any of the various other types of installations—and "at a cost that is appreciably lower."

Investigate the values of this easily installed, low-cost insulation yourself. Use the coupon below for complete information, or see your local GILSULATE distributor.

FACTS ABOUT GILSULATE

1. *Easy to use*—just pour, tamp and backfill... pipe heat does the rest.
2. *Forms 3 zones of protection* against heat loss and all commonly encountered hazards to hot buried pipes.
3. *Needs no* sleeves or mechanical sheaths: no mixing or special handling.
4. *Needs only* normal pipe spacing: for multiple pipe or cramped conditions.
5. *3 types* for varying temperature ranges up to 520° F.


500°
425°
280°
150°
50°
SOIL TEMPERATURE
PIPE WALL
ZONE 1 — a dense semi-plastic core of GILSULATE fused on by the pipe's own heat
ZONE 2—a sintered zone of GILSULATE particles. An excellent insulator, moisture-proof.
ZONE 3 — GILSULATE granules provide a final zone of thermal insulation.

Installing new GILSULATE *system is simply a matter of pouring (note metal forms to conserve material), tamping down...and backfilling.*

THE TRIPLE-ZONE INSULATION FOR LIFETIME PROTECTION OF HOT UNDERGROUND PIPES

GILSULATE®

AMERICAN GILSONITE COMPANY, SALT LAKE CITY 1, UTAH
Affiliate of Barber Oil Corp. & Standard Oil Co. of California

American Gilsonite Co.
134-B West Broadway
Salt Lake City 1, Utah
or
1145 East Jersey St.
Elizabeth, N. J.

Send me more information on GILSULATE Insulation

NAME

TITLE

COMPANY

ADDRESS

HPA

Now Herman Nelson brings you years-ahead features in a new "packaged" Unit Blower!

Save time, make specifying easier with ready-to-install Unit Blowers

A Complete Package — And easy to install! You can select a unit to suit your *exact* needs in moments. No separate base layout is needed for motor and fan; no V-belt drive has to be installed and aligned; no separate belt guard or weather protection need be fabricated and installed. No separate parts to figure.

So Easy To Service — For routine servicing, Herman Nelson Unit Blowers are the most *accessible* blowers you can specify or buy. Hinged weather cover always fits; outboard sheave eliminates need for bearing removal when belts replaced. Adjustable motor mounting may be adjusted up or down, or side to side – quickly.

Compact, Space-Saving — You save valuable floor space – can install a trim unit in spaces where more cumbersome equipment would not fit. Weatherproof cover may even be opened vertically where space is limited.

Wide Range of Unit Sizes — Choose from capacities of 370 cfm to 25,000 cfm. New, advanced design models to handle supply and exhaust installations in schools, hospitals, stores, industrial plants, chemical laboratories – anywhere you have a blower application.

Forwardly Curved and Backward Inclined Wheels — Weatherproof cover and belt guard • Inlet side pedestal (all models 12" up) • Statically and dynamically balanced wheels • Sturdy housings are Bonderite finished to resist rust and corrosion.

NEW

Write for . . . new catalog on Herman Nelson Unit Blowers. Get *all* the facts on ready-to-install "packaged" units designed to simplify your specifying job, save time in installation. Remember, better air is our business, our *only* business for more than thirty years. Address American Air Filter Co., Inc., 373 Central Ave., Louisville 8, Ky.

UNIT HEATERS

INDUSTRIAL HEATERS

AAF herman nelson

American Air Filter
COMPANY, INC.
General Offices, Louisville, Ky.
Plants in Louisville, Moline (Ill.), Morrison (Ill.), Chicago
and Montreal (Canada)

Better Air Is Our Business

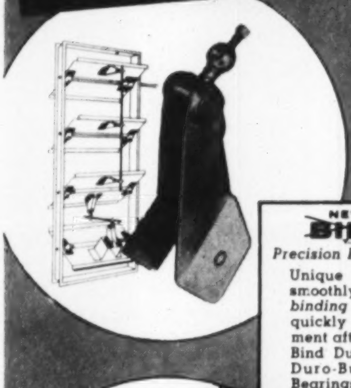
CENTRIFUGAL FANS

INDUSTRIAL EXHAUSTERS

DURO-DYNE makes you the lowest bidder

When you've got to figure tight—when a "pennies per unit" lower bid on a ductwork section, damper or control will clinch the contract...but where quality cannot be sacrificed, investigate Duro-Dyne.

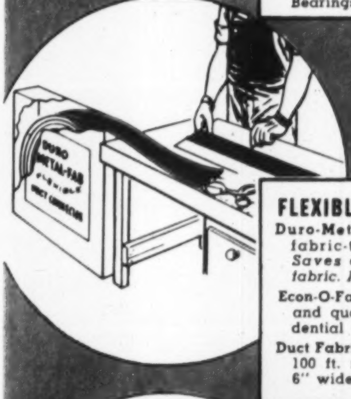
More than 150 Duro-Dyne products for the warm air and ventilating fields save you time and labor, keep your fabrication, assembly and installation costs way down, help you figure lower on jobs. Quality is maintained or, in many cases, improved.



NEVA ~~BIND~~ DURO-BLADE KIT

Precision Engineered Damper Hardware

Unique 4-way adjustability permits smoothly operating, *absolutely non-binding* louvre dampers to be made quickly with little care and no alignment afterward. Kit consists of 1 Neva Bind Duro-Bracket, 1 pair self oiling Duro-Bushings and 1 pair Duro Bearings.


DURO METAL-FAB FLEXIBLE DUCT CONNECTOR

FLEXIBLE CONNECTOR PRODUCTS

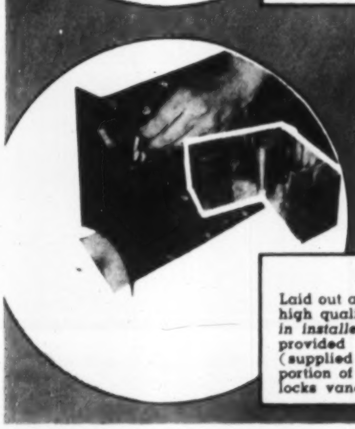
Duro-Metal-Fab — Preassembled metal-to-fabric-to-metal—*Double-Loc Seamed. Saves expense of attaching metal to fabric.* Available in 100 ft. and 50 ft. rolls.

Econ-O-Fab—Lower price, same construction and quality as Duro-Metal-Fab, for residential and lighter gauge ductwork.

Duct Fabric—Quality fabrics without metal. 100 ft. rolls of 6" or 10" wide canvas, 6" wide asbestos and 6" wide neoprene.

JIFFY DAMPER

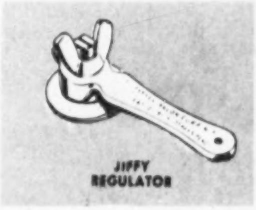
Complete, prefabricated, inexpensive dampers ready for immediate installation in ductwork. Consists of famous Jiffy Regulator preattached to galvanized iron blade. Two styles available: JDS Series with patented Spring-Loc. JD Series — without Spring-Loc.

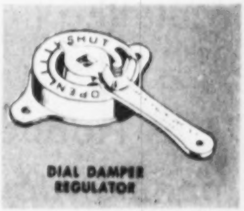


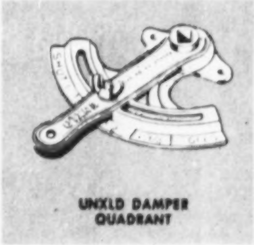
DURO-VANE-RAIL

Laid out and punched side rails for making high quality air turning vanes. *Saves 50% in installed costs.* Insert vanes in notches provided in Duro-Vane-Rail. Place chisel (supplied free with DVR) on protruding portion of vane in slot. One blow securely locks vane to rail.

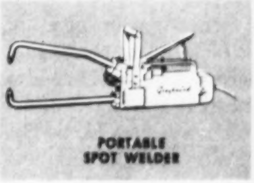
Here is a partial list of Duro-Dyne's large, varied line:

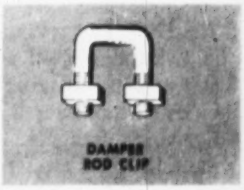

JIFFY REGULATOR

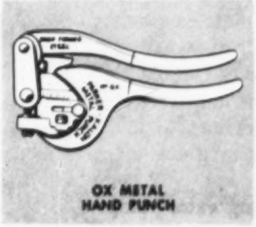

DIAL DAMPER REGULATOR

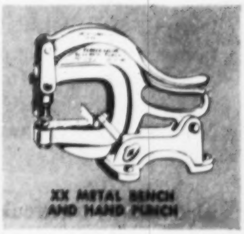

UNXLD DAMPER QUADRANT

HEAVY DUTY and BALL BEARING DAMPER QUADRANTS


PORTABLE SPOT WELDER


DAMPER ROD CLIP


OX METAL HAND PUNCH


XX METAL BENCH AND HAND PUNCH

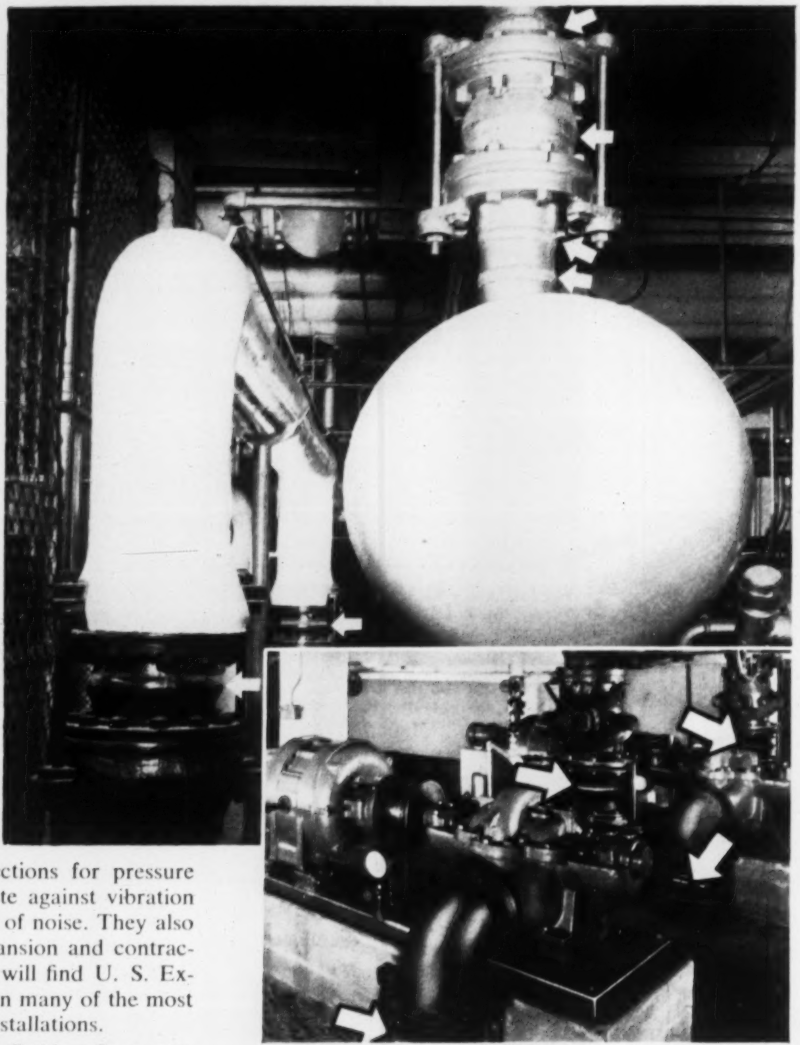
Write us for literature
or see your distributor.

DURO-DYNE CORPORATION

800-D Third Ave., New Hyde Park, New York

FOR SILENT, VIBRATION-FREE AIR-CONDITIONING SYSTEMS

Prevent transmission of compressor noises in circulating lines with U. S. Rubber Expansion Joints



A compressor with expansion joints on the suction and discharge lines. Suction line is at bottom, discharge line at top. Expansion joints were vulcanized to welded flanges at our factory, to handle Freon in the compressors.

Photo shows expansion joints connected to condenser and cooler and on pipe lines at circulating water pump.

These flexible rubber connections for pressure and vacuum pipe lines insulate against vibration and prevent the transmission of noise. They also offset stresses caused by expansion and contraction and misalignment. You will find U. S. Expansion Joints are standard on many of the most up-to-date air-conditioning installations.

A product of United States Rubber Company, these U. S. Expansion Joints have many applications in air conditioning: they are used for the chilled-water lines from the water chillers, and the refrigerant lines from the refrigerating compressors; also the water lines to and from the cooling towers. They are used on the header connections to the condenser and to the cooler and on pipe lines at the circulating water pump.

For handling Freon in compressors, there is a specially-designed U. S. Freon Expansion Joint.

Since they have no moving parts to wear or bind, U. S. Expansion Joints last a long time. Some are still in service after 30 years—a record unmatched by any other expansion joint! U. S. Expansion Joints will solve any pipe line problem caused by noise, vibration and misalignment. They are obtainable at any of the 27 "U. S." District Sales Offices, or write us at Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

Now every room and office can be comfortable

Iron Fireman SelecTemp heating has a thermostat in every room

The *ultimate* in heating comfort—*a thermostat* in every room—is both simple and practical with the Iron Fireman SelecTemp heating system. Occupants of each room or office can select any temperature desired, at any time. Rooms stay at the selected temperatures. Each room unit automatically compensates for heat gains and losses caused by changes in outdoor temperature, cold winds and warmth from the sun—increasing or decreasing heat output.

SELECTEMP HIGHLIGHTS

THERMOSTAT IN EVERY ROOM. Temperatures can be varied in every room to fit the "activity plan" and personal preference of the occupants.

MODULATED HEAT. Air circulation is continuous. Both temperature and volume of air are automatically modulated, as required to offset heat loss from room.

FILTERED, CIRCULATED AIR. Individual room air circulation prevents transmission of odors or bacteria from other rooms. Air is cleaned by a spun glass filter in each room unit. Filtered outside air can be introduced if desired.

BOILER LOCATION. Boiler can be placed in any desired location, with proper distribution of heat to every room. Year-around domestic hot water coils available.

LOW POWER COST. No electricity required to operate circulating fans. Nonelectric thermostats.

LOW INITIAL COST. Easily installed in either new or old construction. Small soft copper tubing (1/4 inch I.D.) carries steam to individual room heater units. Return lines are 1/8 inch. Substantial savings in installation costs.

LOW FUEL COST. Temperature easily reduced in unused rooms. Also eliminates overheating.

AUTOMATICALLY BALANCED. No special adjustments of dampers, valves or orifices required to balance heating system. Each unit continuously regulates heat needed for each room. Automatically compensates for external heat sources such as fireplace or solar heat, without affecting temperatures of other rooms.

ECONOMICAL INSTALLATION AND OPERATION

Regardless of the type or size of structure; office building, hotel or apartment house, school, hospital, or house, SelecTemp heating can be economically and efficiently installed. Flexible copper tubing, smaller than your little finger, carries low pressure steam to each room unit.

In addition to individualized heating comfort SelecTemp brings substantial operating savings. The fuel waste resulting from overheating (symptom: occupants open the windows), and the unnecessary heating of unused space, is eliminated. A fan in each room unit, operated by a steam turbine, continuously circulates filtered warm air. No electricity is used for fans or thermostats.

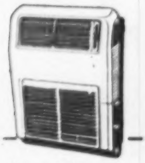
ASK FOR FULL INFORMATION

Before choosing a heating system for any building or residence, whether new construction or being modernized, it will pay you to get the facts about the Iron Fireman SelecTemp—a completely new concept in heating practice. Just mail the coupon or write.

Iron Fireman®

SelecTemp®

MODULATING ZONE HEATING



Send for free booklet

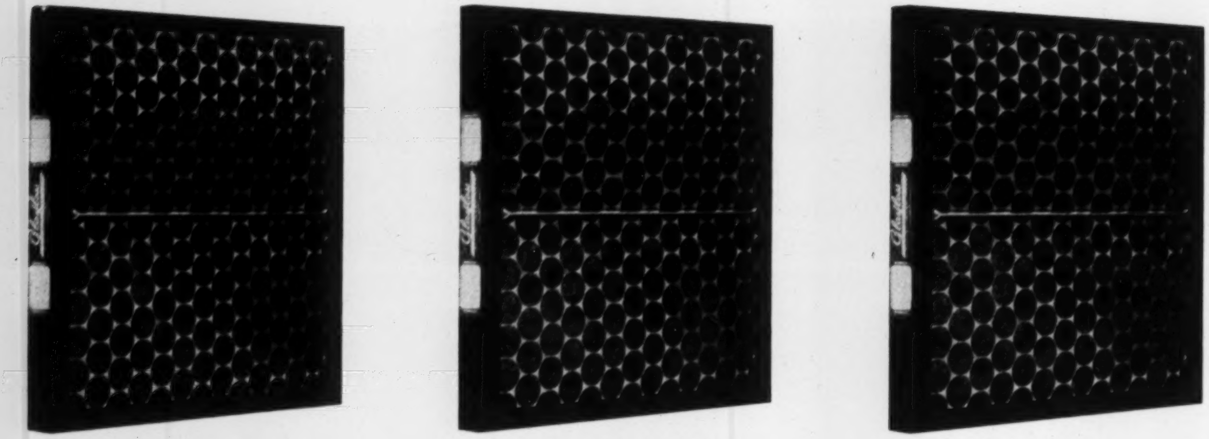
3041 West 106th Street, Cleveland 11, Ohio.
IRON FIREMAN MANUFACTURING CO
In Canada, write to 80 Ward St., Toronto, Ontario.

Send literature on Iron Fireman SelecTemp heating.

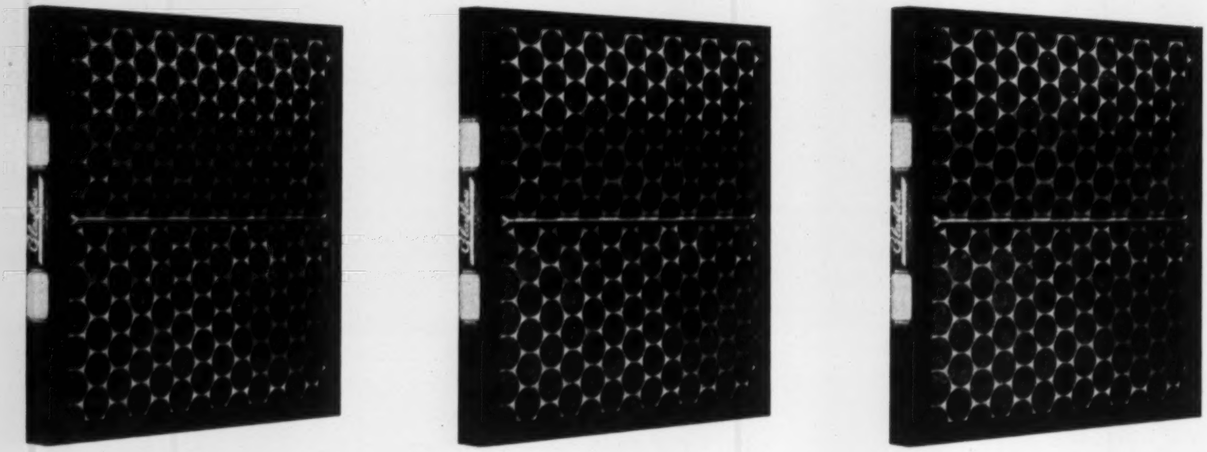
Name

Address

City State



NEW AND IMPROVED AIR FILTERING...



FIBER PPG GLASS Glasfloss DISPOSABLE AIR FILTERS

The new, extremely fine, silky fibers in Pittsburgh's improved Glasfloss Filters stop and hold more dust—and are easy on the hands!

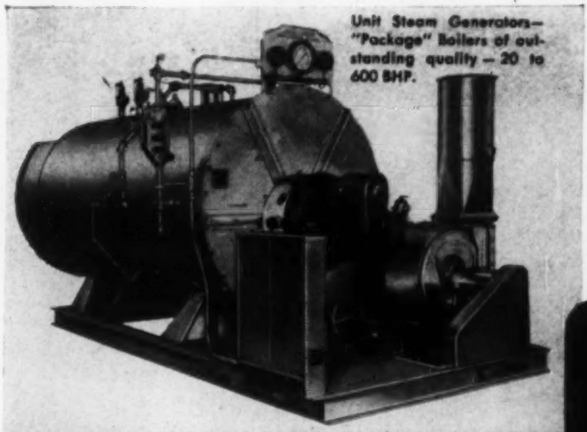
Available in all standard furnace and air conditioning filter sizes, Glasfloss filter media is also available in Bulk Roll-Paks to provide convenient and economical replacement material for all commercial and industrial filtering uses.

For complete information and prices, write Glasfloss Dept., Fiber Glass Division, The Pittsburgh Plate Glass Company, One Gateway Center, Pittsburgh 22, Pennsylvania.

FIBER PPG GLASS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

PITTSBURGH PLATE GLASS COMPANY

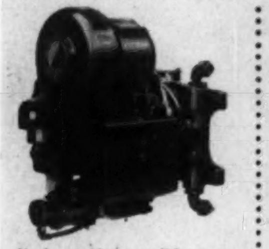


Unit Steam Generators—"Package" Boilers of outstanding quality — 20 to 600 BHP.

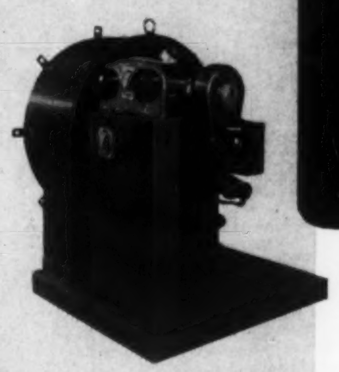
A Single Dependable Source that SAVES You Time and Money

PREFERRED UTILITIES

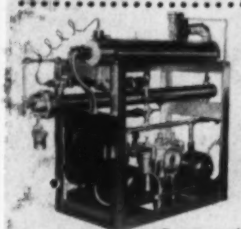
for Automatic Heating



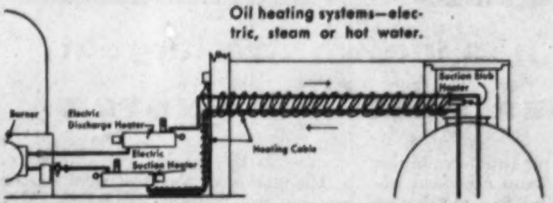
Horizontal rotary oil burners —7½ to 175 gph. Also combination oil- gas burners.



"Thermopak"—packaged automatic oil or gas combustion system for all boilers.



Pump and heater sets—oil delivery sizes from 110 to 1200 gph.



Oil heating systems—electric, steam or hot water.

Meet Your Equipment Needs with

Unit Steam Generators
"Packaged" Burner Units
Horizontal Rotary Oil Burners
Combination Oil-Gas Burners
Fuel Oil Heaters and Preheaters— Electric or Steam
Heating Systems for Fuel Oil Piping
Oil Pump and Heater Sets
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Draft-A-Justors—Industrial and Commercial
and a Complete Line of Accessories and Specialties for Automatic Oil Burning and Combination Oil-and Gas-Burning Systems

Draft-A-Justors — barometric type—cut boiler stack losses.

Get the full facts on Preferred Time- and Money-Saving Equipment. Mail this coupon today.

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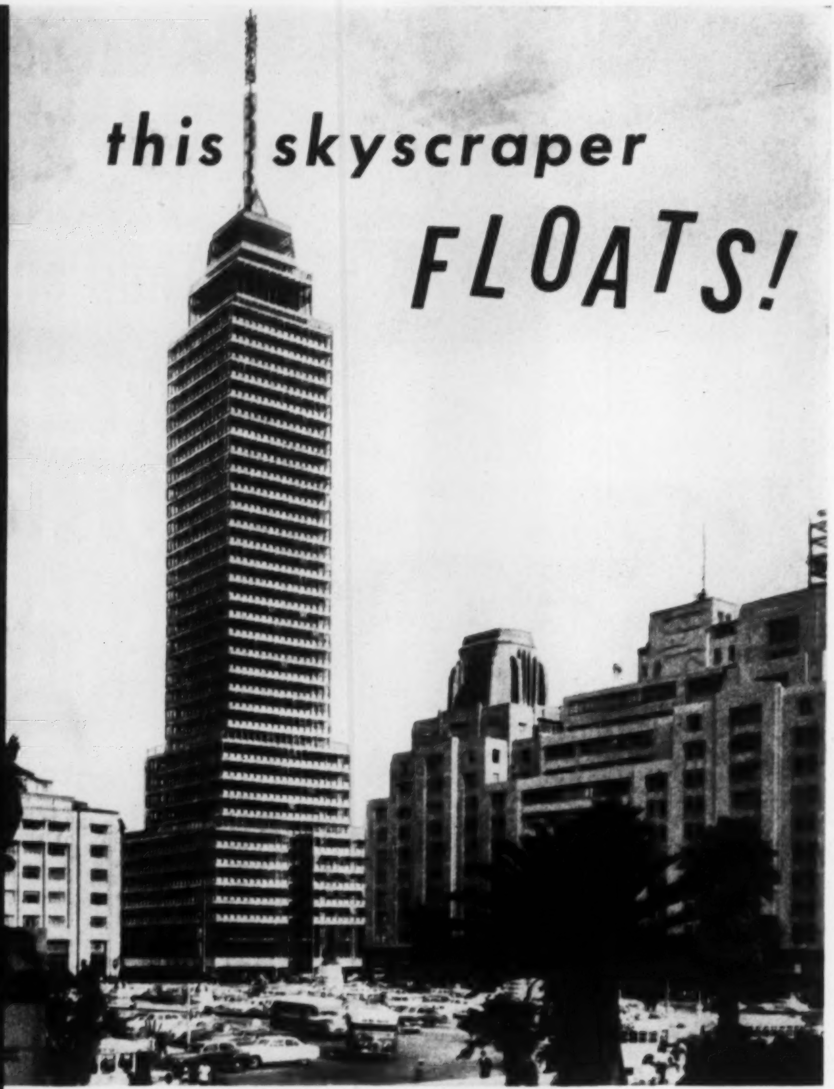
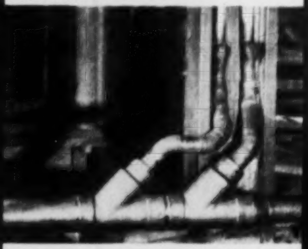
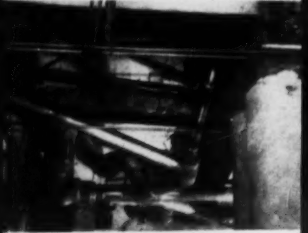
CITY ____________ STATE ____________



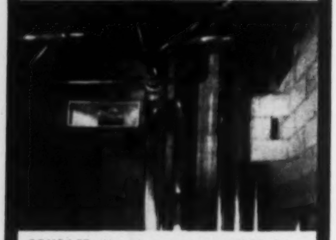
RIGID—NIBCO solder joint fittings, when properly installed, provide a piping system of continuous copper.

SMOOTH—The smooth interior surfaces of NIBCO cast drainage fittings match perfectly with the tubing, to provide unrestricted flow.


ENDURING—Copper tube and NIBCO A.S.A. fittings were specified for this job because of high resistance to the corrosive effects of water and waste material.


COST—When engineers finished this job, they actually found that the final installation cost of copper tube and NIBCO fittings was competitive.

JOIN UP WITH
NIBCO


COMPACT—New design, compact NIBCO fittings and the solder joint principal permit close/ruff, saving valuable space.

. . . and it has the world's largest

COPPER DRAINAGE SYSTEM

One of the most unique structures in the world, the 46-story Latin American Insurance Company Building in Mexico City, actually *floats* on a sea of liquid clay. It's underpinnings were framed in the fashion of a ship, and this watertight cell supports 60% of the total weight of the structure. Four piles driven down 108 feet into firm sand sustain the remaining weight. An intricate hydraulic system in the basement stabilizes the building by equalizing the pressure at the four corners.

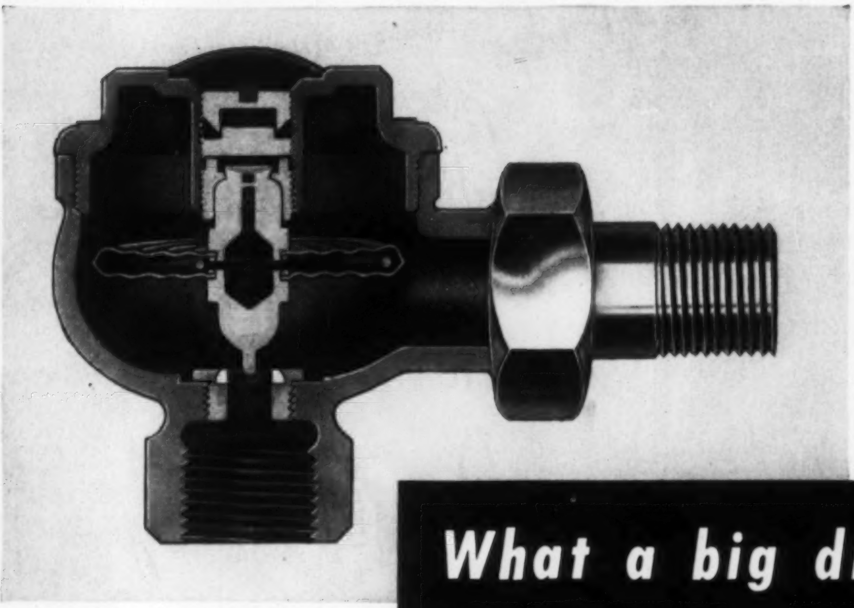
The superstructure of this building was formed of extra-heavy steel because of the ever present possibility of earthquakes in this active volcanic zone.

The main floor was fabricated in four sections and mounted on screws. This enables it to be lowered in accordance with the natural subsidence of the ground level, forestalling the necessity of building steps UP to it, in the future.

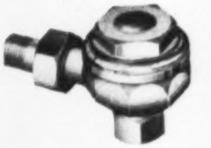
The engineers on this job specified copper for all of the sanitary drainage, water supply and refrigeration lines. It's long life, light weight and high shock resistance made it the only logical piping medium. Seamless copper tube joined with NIBCO fittings assures long, trouble-free service—and at competitive prices.

Write for "NIBCO Drainage Manual No. 1."

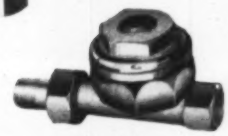
NORTHERN INDIANA BRASS COMPANY
171 PLUM STREET, ELKHART, INDIANA



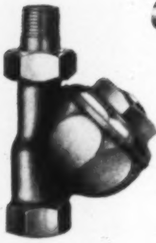
What a big difference a trap can make!



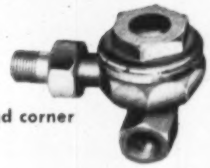
Angle



Straightway

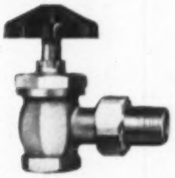


Vertical



Left hand corner

Right hand corner



Marsh Packless Radiator Valves are perfect team mates for Marsh Radiator Traps. The metal-to-metal seal places them in a class all their own.

Yes, the success or failure of a steam distribution system can hinge on things as small as radiator traps. That's why it pays to use Marsh Radiator Traps—traps that are individually and permanently adjusted to close tight on steam, but open promptly and pass air or condensate at temperatures only a few degrees below closing temperature.

The part that provides positive operation in Marsh Radiator Traps is that rugged-but-sensitive thermostatic diaphragm. After this element has been assembled it is made completely seamless by a heavy overall deposit of copper. It is then filled with an accurately measured charge of volatile fluid; finally tested by expert operators to make sure that its expansion and contraction is exactly right to produce the utmost efficiency and economy.

Construction throughout is in keeping with the effective diaphragm. Bodies are of extra heavy cast brass suitable for pressures up to 125 lbs. steam. Bonnet assemblies of a given type and size are interchangeable. Trap seats are renewable. All components are made with a large safety factor beyond rated operating pressures.

Next time make it Marsh throughout and see the difference . . . Marsh traps, packless valves, bucket traps, venting valves. All are covered in the new fact-filled catalog.

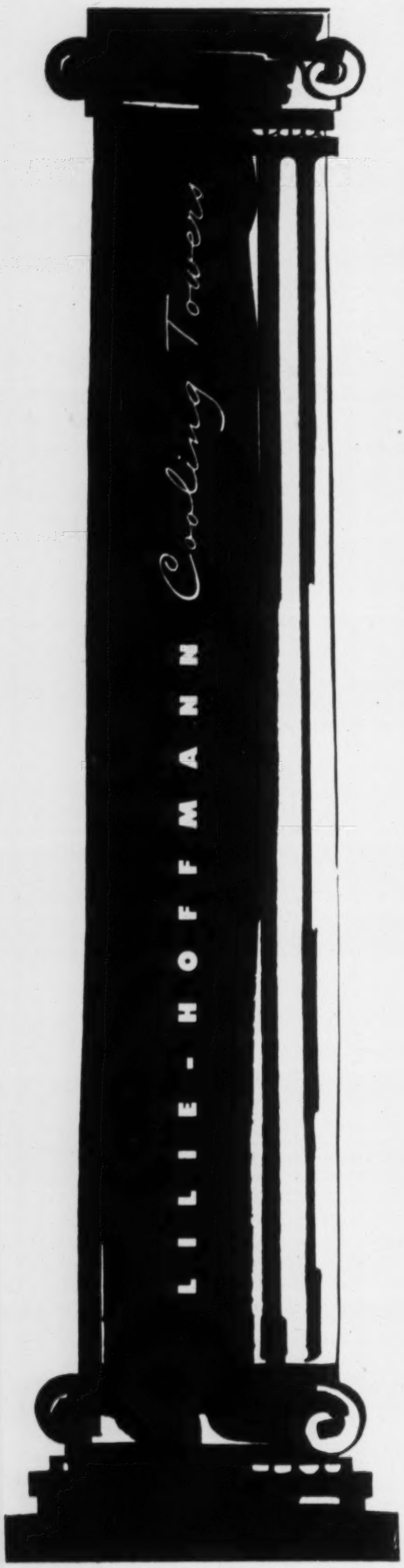
MARSH HEATING EQUIPMENT CO.

Sales affiliate of Jas. P. Marsh Corporation

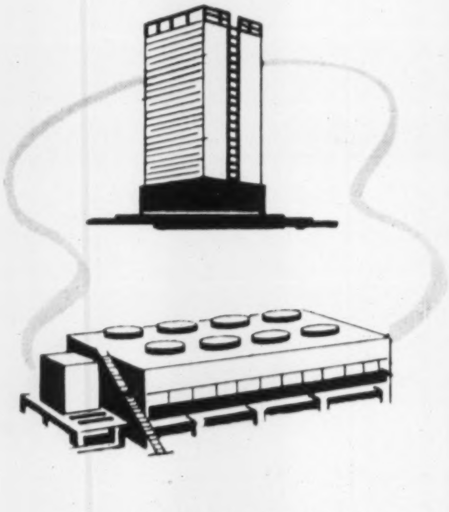
Dept. T, Skokie, Illinois

MARSH

Heating Specialties **SINCE 1865**


LILIE-HOFFMANN
Cooling Towers

Quality Unexcelled in Design, Construction, Performance



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Capacities from 3 Tons Up for
Every Need and Requirement
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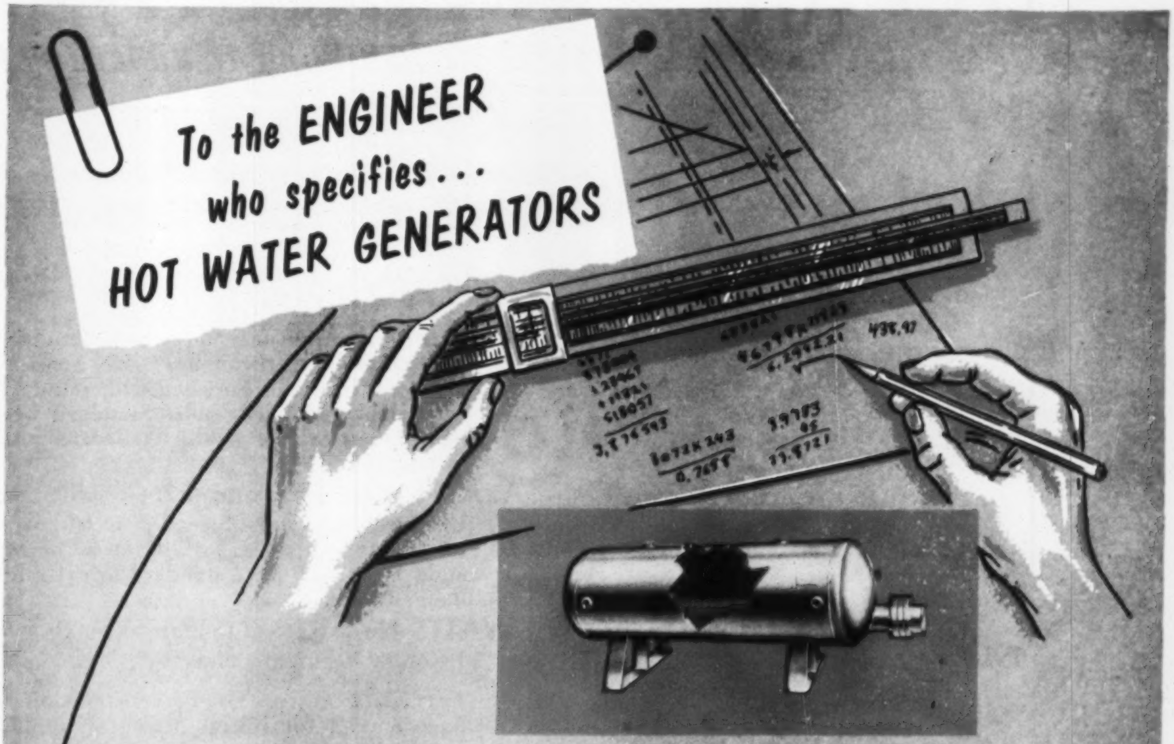
New LH Towers

PRESSURE REGULATORS



To the ENGINEER who specifies . . . HOT WATER GENERATORS

A New Concept for Longer Life

The life and satisfaction of a Hot Water Generator depends on three factors; 1) proper sizing of vessel, 2) proper sizing of heating element and source of heat, 3) reducing corrosion to a minimum. Incorrectly calculating any of these factors might make early replacement of the unit necessary.

Today, NOVELTY offers a new concept of corrosion resistance—the new NOVELON Baked-on Plastic Lining. This new multi-applied, phenolic resin coating is the most successful anti-corrosion measure ever developed for steel vessels. It is low in initial cost; heat resistant—up to 500° F.; leaves a smooth, non-porous surface that is easy to clean; imparts no color, odor or taste—particularly rust-color; and will not deteriorate with age.

When specifying Hot Water Generators, Heat Exchangers, Air Receivers, Storage Vessels and Novelon Linings, let NOVELTY'S Engineering and Sales Departments help you specify the correct vessel to meet your needs. Let our 50 years of experience be your assurance that the vessel you specify is the best, most advanced vessel available.

FREE CATALOG
Write today for 34 page reference catalog.

"Specify NOVELTY or Equal"

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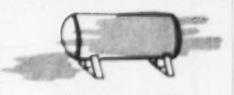
STEAM BOILER WORKS, INC.

CLARE AND KLOMAN STREETS
BALTIMORE 30, MARYLAND

HOT WATER GENERATORS



STORAGE TANKS

SPECIAL LININGS

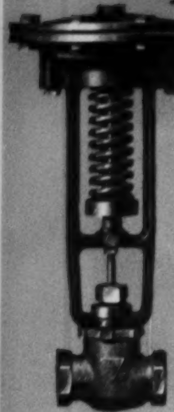
SPECIAL FABRICATION

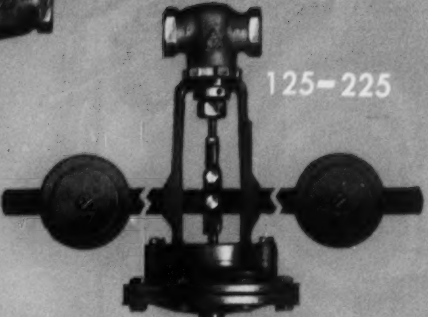
NOVELTY STEAM BOILER WORKS, INC. REPRESENTATIVES IN MAJOR CITIES

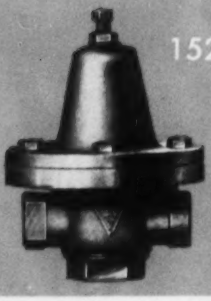
PRESSURE REGULATORS

for Commercial, Industrial, Institutional application...

STEAM & AIR SERVICE







WATTS Nos. 127 and 125 Single Seated Pressure Regulators, Sizes ½″ to 4″. Initial pressures up to 250 lbs.

No. 127 spring type — Reduced pressure range 10 to 100 lbs.

No. 125 weight and lever type — Reduced pressure range 1 to 15 lbs.

Furnished in bronze body construction with screwed ends up through 3″ size. Sizes 2½″, 3″ and 4″ may be furnished with standard or extra heavy flanged ends. Standard bronze trim or special metal alloy trim can be furnished.

WATTS Nos. 227 and 225 Double Seated Pressure Regulators, Sizes ½″ to 6″. Sizes up to 2″ are available with screwed or union ends. 2½″ to 6″ have standard or extra heavy flanged ends.

WATTS No. 152 Self-Contained Single Seated Pressure Regulator, Sizes ½″, ¾″, 1″.

Furnished in iron body construction with bronze trim for initial pressures up to 150 lbs. Reduced pressure ranges 5-40, 25-100 lbs. Furnished in bronze body construction for initial pressures up to 250 lbs. and reduced pressures up to 200 lbs.

For complete information

Send for . . .

Steam Catalog Folder F-127A.

WATTS No. 135 Self-Contained Reducing Valve. Sizes ½″ to 2″. All bronze unit incorporating integral strainer.

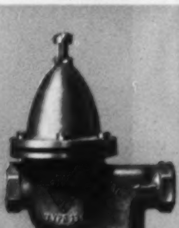
WATTS No. 223 High Capacity Self-Contained Reducing Valve, Sizes ½″ to 2″. All bronze construction. Also available with separate strainer. When furnished with separate strainer, specify No. 223S.

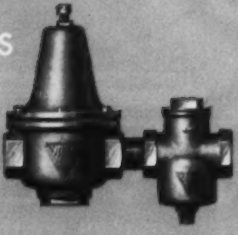
WATTS No. 127W Remote Control Diaphragm Spring Type Pressure Reducing Valve. Sizes ½″ to 3″. These valves have wide industrial applications where water reducing valves must reach full capacity with minor drop in reduced pressure. Initial pressures up to 250 lbs. Reduced pressure ranges available from 10 lbs. to 100 lbs.

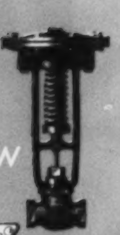
Send for . . .

Folder F-135A with complete product details and specifications.

WATER SERVICE







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Information on the purpose, cost, design, operation and maintenance of both process and comfort air conditioning systems in manufacturing plants of many kinds. The combined knowledge and experiences of 33 prominent engineers, every one a designer or in direct charge of the largest factory air conditioning systems in operation. This shows other engineers how air conditioning helps speed production, improve products, increase worker efficiency and operate systems economically. 186 pages, $1.50

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A practical manual on fume removal, dust collecting, ventilating and exhaust systems for industrial plants. Tells how to design correctly and provide for various ventilation requirements . . . make measurements and analyses of fumes, mists and dusts . . . plan exhaust systems, etc. Twenty eminent authorities contributed also to detailed descriptions of systems in actual operation in many plants. 134 pages, $1.50

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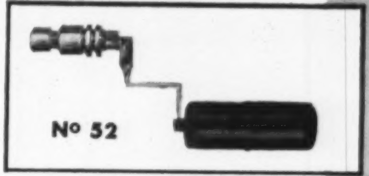

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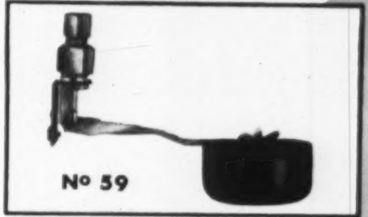

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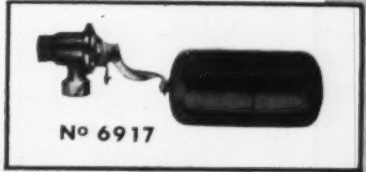

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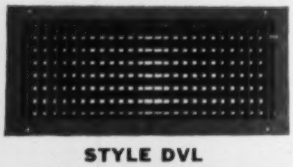

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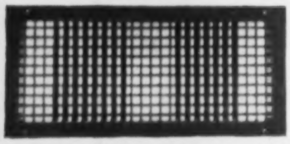

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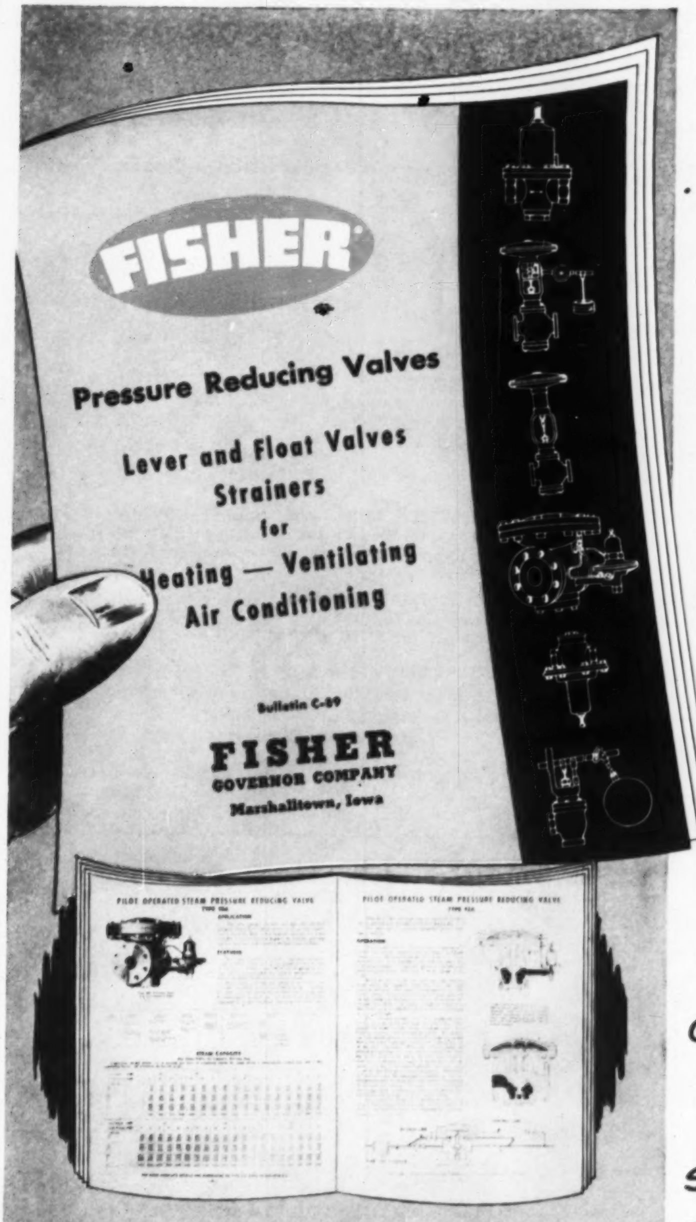

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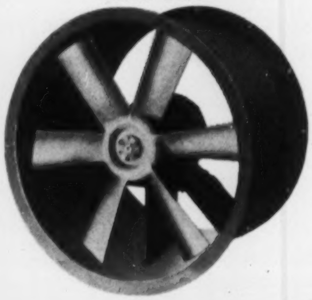

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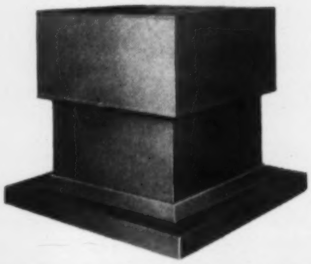

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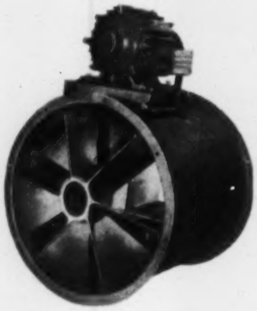

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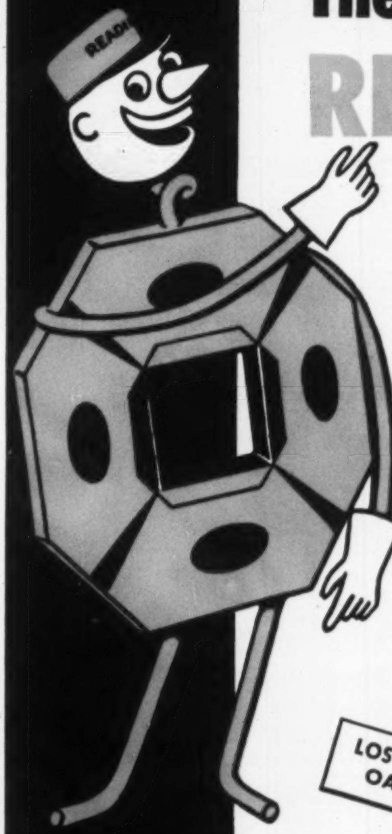

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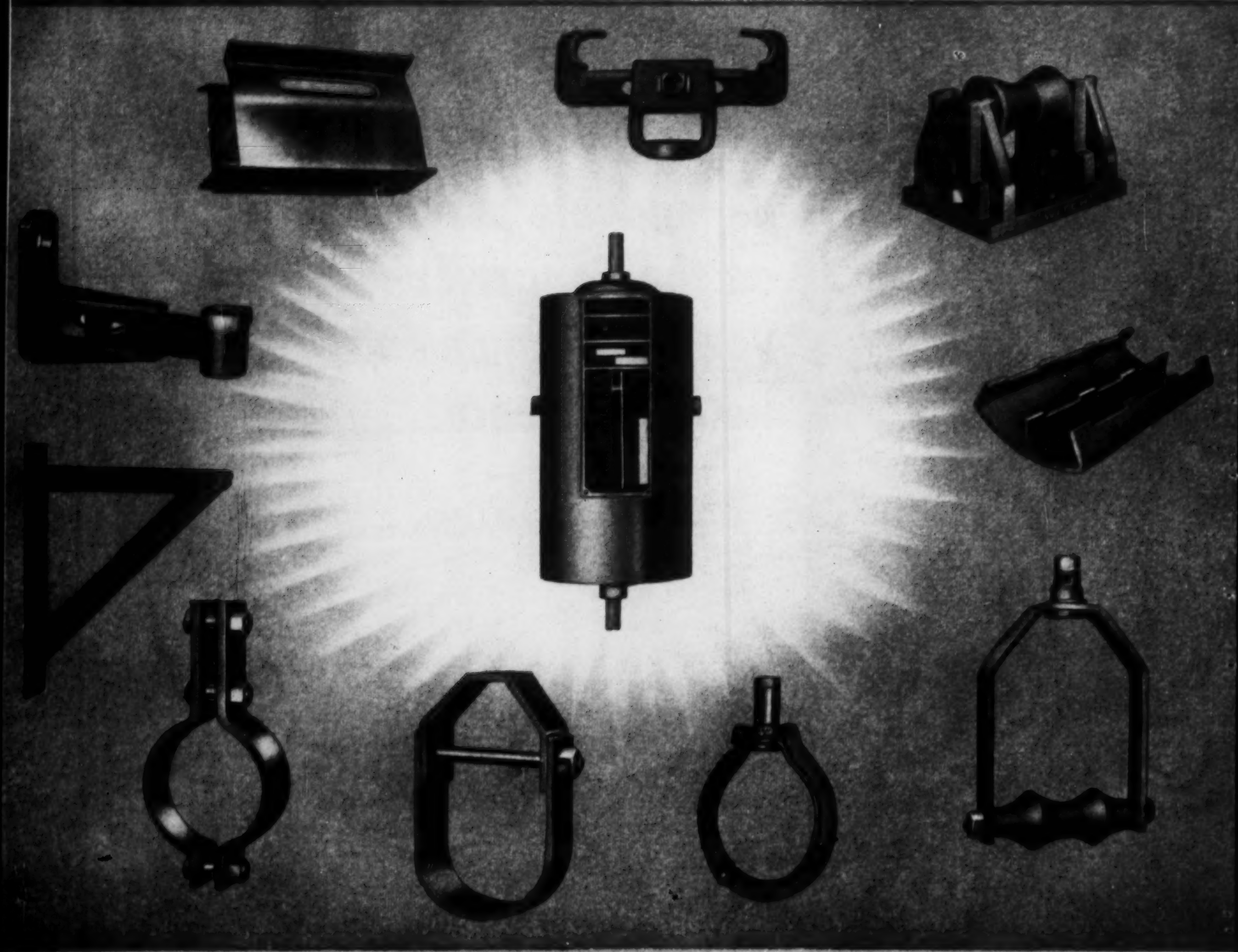

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BEFORE YOU BUY A PACKAGE BOILER

CHECK THIS LIST!

If you need a package boiler, the list at the right can give you some interesting answers. Of course, C-E's Type VP Boiler rates a "yes" answer to every question. It offers also many other operational advantages, such as simple, effective soot blowing; high heat absorption; low draft loss, no dead gas pockets and simple baffle arrangements.

That's why VP purchasers range from small companies to some of the nation's largest – plus schools, institutions, government agencies, including the Atomic Energy Commission. These users employ VP Boilers for all types of applications – heating, process, even power generation.

SPECIFICATIONS OF THE VP BOILER

Capacity — 4,000 to 40,000 pounds of steam per hour
Pressures — up to 500 pounds per square inch
Fuel — oil or gas
Erection — completely shop-assembled
Foundation — simple concrete slab

Have full details on the VP next time you are in the market for a boiler of moderate capacity. Get the new Catalog VP-177, which contains specifications, and information on dimensions, construction details and controls. B-845B

	BOILER					
	A		B		C	
	Yes	No	Yes	No	Yes	No
Will your boiler be a real "package" type with control panel and all controls mounted integral with the boiler?						
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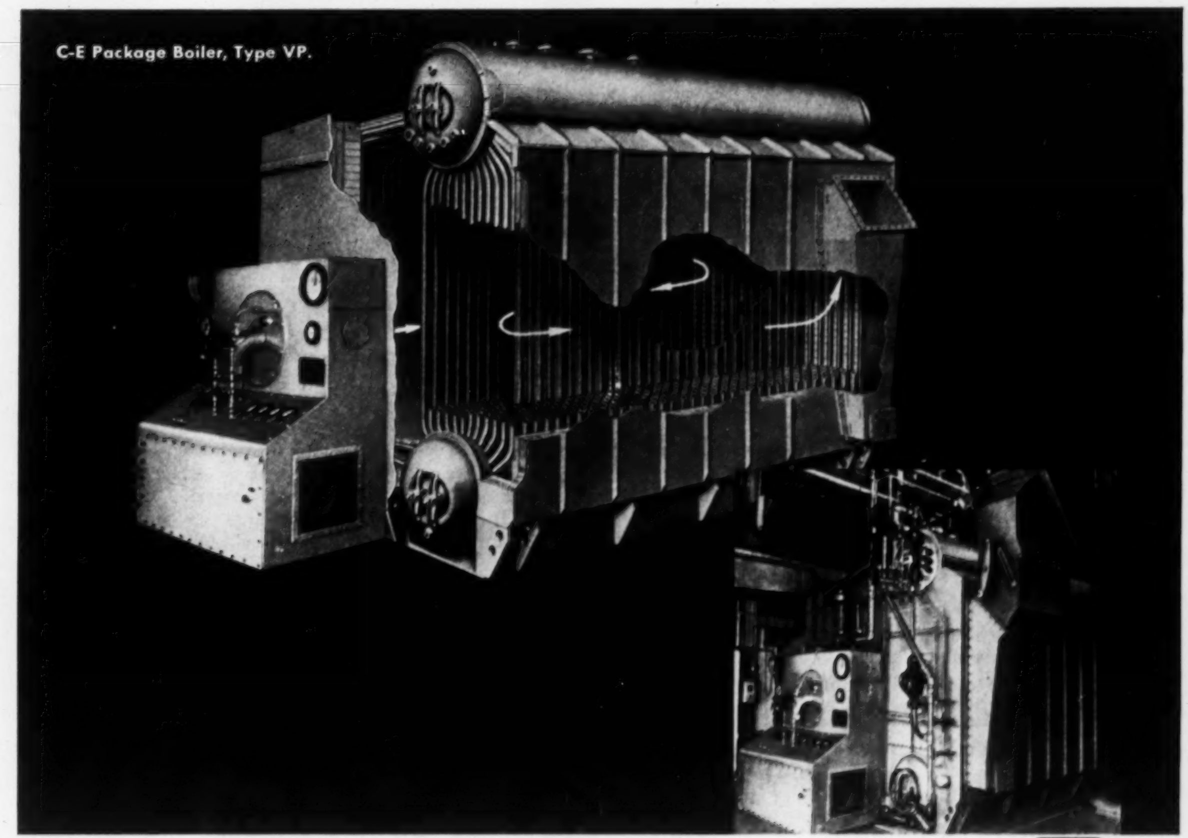
C-E Package Boiler, Type VP.

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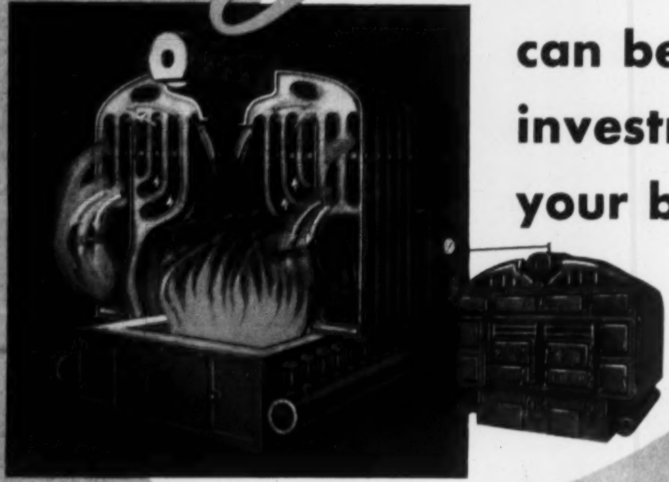
Why H.B. Smith CAST IRON BOILERS

can be the best investment in your building



Here are eight feature points which your new heating plant should possess if you are to get your money's worth.

1 Long Life, Low Maintenance

Cast iron is impervious to acidic residues of burned gases.

Virtually indestructible with normal care.

2 Economy of Operation — Lowest Cost-per-Year

Mills flue design exacts full fuel value, therefore uses less fuel.

Cast iron absorbs heat quickly for fast steaming.

3 Ease of Installation

Minimum space required.

Sections easily carried through conventional entrances.

4 Avoidance of Boiler Shutdowns

Header principle permits cutting-out of any section without impairing operation of other sections. Such cut-out made easily in a short time.

5 Ease of Expansion

H. B. Smith boilers are of sectional type and therefore may be increased in size to take care of building additions.

6 Ready Convertibility

High efficiency with oil, gas or solid fuel; easily converted for use with one fuel or type of firing to another.

7 Adaptability

Low head room required.

Can be used singly or in batteries to assume any heating load.

Ideal basic unit for large, intricate installations involving school room units, air conditioning, etc.

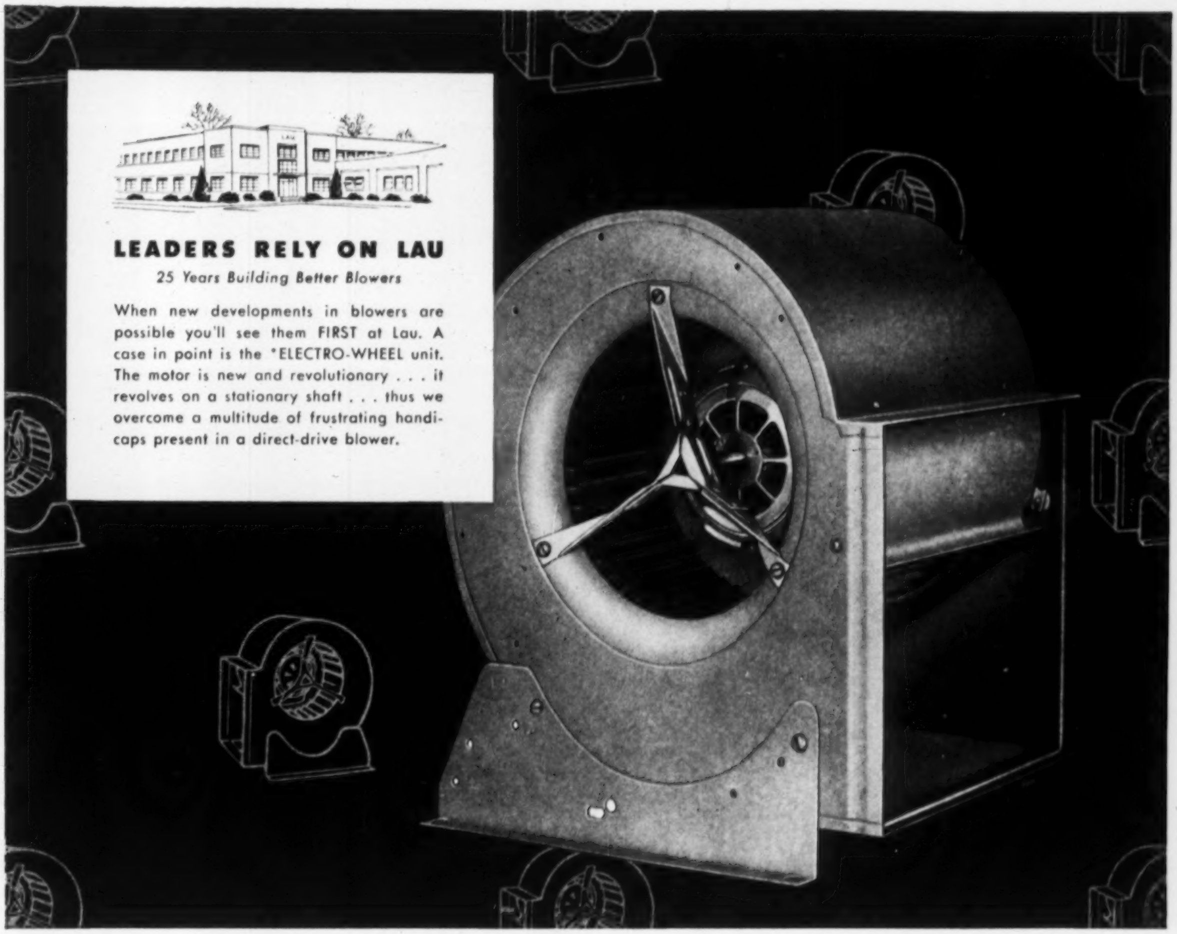
8 Reliability

H. B. Smith Co. is the oldest manufacturer of large cast iron boilers for churches, schools and institutions. Tens of thousands of installations of H. B. Smith boilers are living proof of the fact that H. B. Smith is your best buy in boilers.

* * *

If you have a problem — whether in new construction or the replacement of inefficient, fuel-consuming equipment, why not consult your heating engineer or contractor regarding the money-saving possibilities of H. B. Smith boilers?

H.B. Smith CO., INC.
Westfield, Massachusetts



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25 Years Building Better Blowers

When new developments in blowers are possible you'll see them FIRST at Lau. A case in point is the *ELECTRO-WHEEL unit. The motor is new and revolutionary . . . it revolves on a stationary shaft . . . thus we overcome a multitude of frustrating handicaps present in a direct-drive blower.

FIRST IN THE INDUSTRY

*ELECTRO-WHEEL is the name of this new Lau direct-drive blower that will deliver *more* air with *less* power load than ever before, because it has unobstructed air inlets on both sides of the wheel. The new, compact motor, an integral part of the blower wheel center disc, revolves on a stationary shaft, rubber-encased on both ends. This means efficient elimination of noise and vibration. And two rigid tripod mountings have minimum interference to air flow . . . give greatest shipping strength. Five sizes: 9" and 10" wheels; air deliveries from 500 to 1500 cfm; ¼ h.p. motor. Available with or without housing supports which may be mounted in pre-punched holes for any discharge angle. Write Lau, Dept. M for further data.

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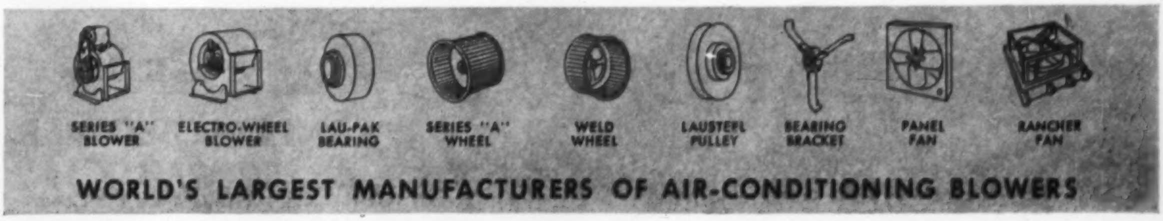
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WORLD'S LARGEST MANUFACTURERS OF AIR-CONDITIONING BLOWERS

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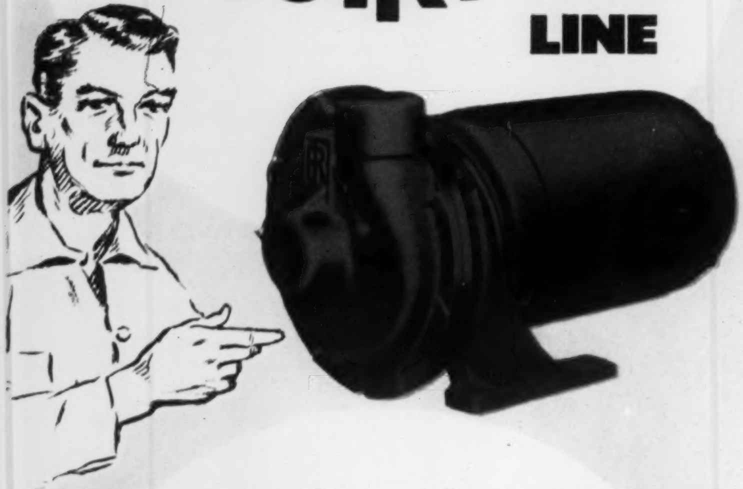

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Get more detailed information by sending for **MOTORPUMP** bulletin showing units ¼ through 75 horsepower.

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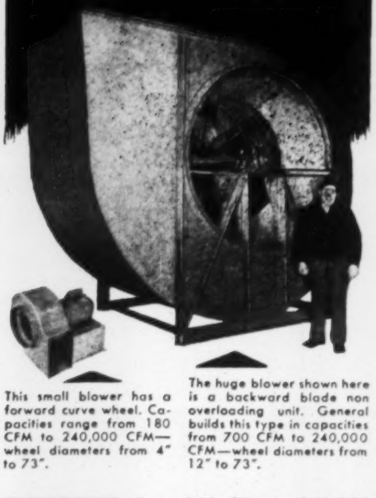
King Size

OR PINT SIZE?



This small blower has a forward curve wheel. Capacities range from 180 CFM to 240,000 CFM—wheel diameters from 4" to 73".

The huge blower shown here is a backward blade non overloading unit. General builds this type in capacities from 700 CFM to 240,000 CFM—wheel diameters from 12" to 73".

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STEEL PLATE

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From 180 CFM to 240,000 CFM—wheel diameters from 4" to 73". Do you want a gentle zephyr or are you out to move a whale of a lot of air?

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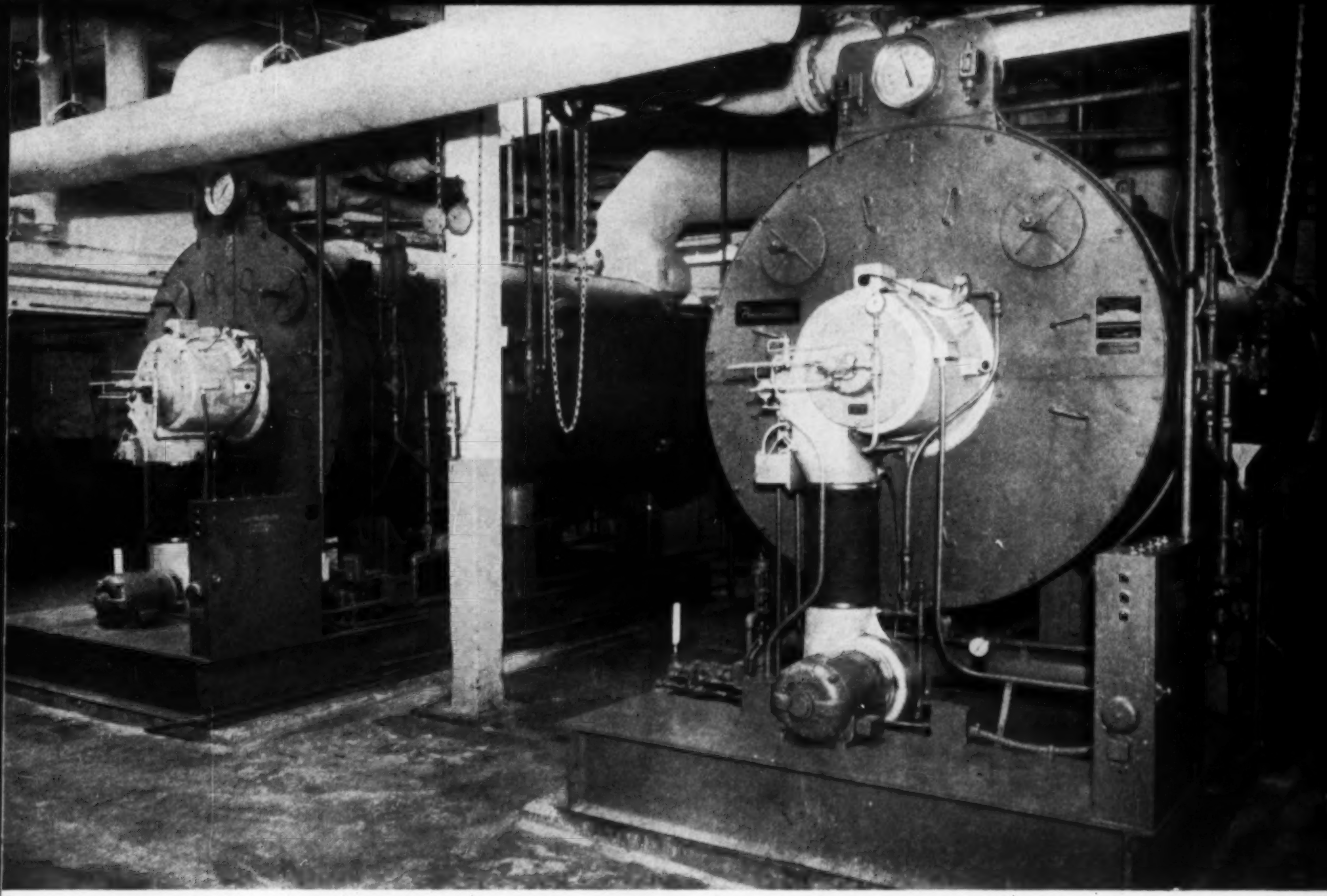

$9,040 Saving in Steam Cost

WITH *Powermaster*® PACKAGED AUTOMATIC BOILERS

You get MORE than low-cost steam with Powermasters:

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- ★ Quick fuel change-overs
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- ★ Clean, quiet operation
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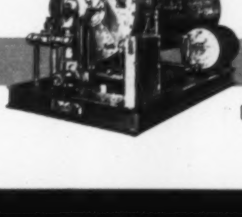
- ★ Pay-As-You-SAVE Purchase Plan

These two 200 HP *Powermaster* Packaged Automatic Boilers are saving 50% of steam costs annually for a large manufacturer of clothing. In addition, they are providing hotter, drier steam for processing and comfort heating.

Completely factory assembled and fire-tested *Powermasters* have gained world-wide acceptance as dependable producers of low-cost steam or hot water. And now, you can put a *Powermaster* in your plant or building on the Pay-As-You-SAVE Purchase Plan, that helps you pay for your new boiler out of its own savings.

Write for Bulletin 1220, or ask our representative to explain why it pays to modernize with *Powermaster*.



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PACKAGED AUTOMATIC BOILERS

In sizes to 500 HP; pressures to 250 psi.

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Permanent Type

ELECTRO STATIC FILTERS

The Amazing DRY Filter that meets the requirements of professional engineers

1/2", 1", 2" Thicknesses

TIME TESTED Natural Hair Media treated with the new miracle SARAN makes possible a light weight low-density filter of extraordinary efficiency and long life.

FILTR-AIRE does the job better from the moment of installation.

First, you get really good filtering action, tremendous dust holding capacity, and integral loading. Second, the cost is reasonable. Third, maintenance is easy and fool proof. You simply hose to clean. No oil to apply. No mess. No explosion hazards. No expensive down time.

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A SIZE FOR EVERY TYPE AND SIZE OF AIR HANDLING EQUIPMENT

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PERMANENT ELECTRO-STATIC WASHABLE FILTERS

Engineered for Engineers

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. . . and Here's Why:

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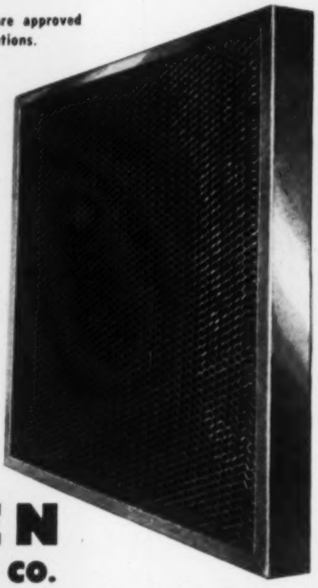


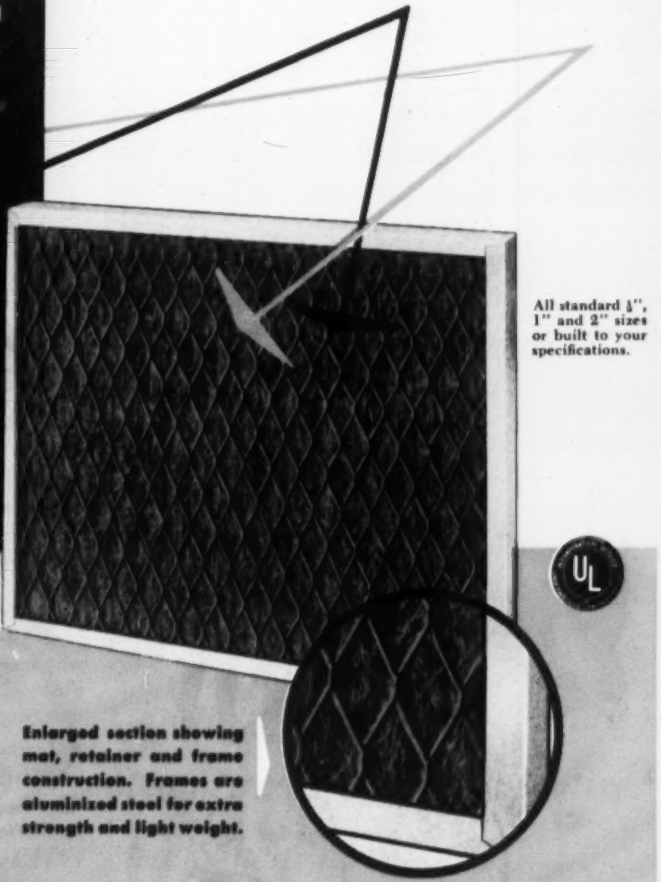
National Representative

PEDEN EQUIPMENT CO.

4512 Mt. Vernon Houston, Texas

stop wasting money on 'throw-aways' with new A-Lum-O-Aire Copper FILTERS

designed for industrial air-cleaning requirements



All standard ½", 1" and 2" sizes or built to your specifications.

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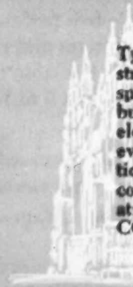

Typical of hundreds of Old World structures with copper roofs and spires, the Cathedral of Canterbury (England) has withstood the elements for centuries without evidence of decay or deterioration. Nothing resists weather like copper; nothing resists corrosive atmospheres like A-LUM-O-AIRE COPPER Filters!

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Impervious to hazardous industrial atmospheres, new A-LUM-O-AIRE COPPER Filters are the practical solution for handling corrosion and moisture-laden fumes, vapors and gases. Copper wool, used as the filter media, is manufactured by Carey to precision standards from special alloys developed expressly for air cleaning. Mat retainers are copper plated for longer life with added protection against rusting and corrosion.

QUICKLY CLEANED for CONTINUOUS USE

Simply flush A-LUM-O-AIRE COPPER Filters with water or solvent and replace. No hazardous oils to add; no messy adhesives required. END pyramiding filter replacement costs NOW with the filter designed for the rugged demands of industry. Available in standard and high-velocity types for normal resistance or engineered to your specific size and capacity requirements.

Carey
ELECTRONIC
ENGINEERING CO.
METAL WOOL DIVISION
SPRINGFIELD, OHIO

"world's largest manufacturers aluminum and copper wool"

If filtered air is important to your production or operating schedules, here NEWS you can't afford to pass up! Why? Because A-LUM-O-AIRE COPPER Filters save on replacements, eliminate maintenance expense and increase air cleaning efficiency!

Like to see the proof? Then, write for folder showing typical performance curves and operating data – or send us your specifications with prints or detailed drawings for prompt recommendations and quotations. No charge or obligation, of course!

America's first practical recleanable all-metal, dry-type air filter! Approved by Underwriters (Class 1)!

A-Lum-O-Aire

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Carey Electronic Engineering Co.
Metal Wool Division
1883 Clifton Avenue
Springfield, Ohio

☐ send folder

☐ we're sending data for quote

Tell me more—
about your new A-LUM-O-AIRE Filters and show me how we can save money on our air-cleaning activities.

Name________________ Title________

Company________________

Address________________

City________________ Zone____ State________

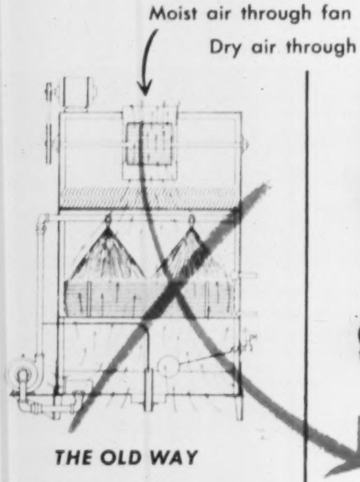
When you buy an evaporative condenser...

Think YEARS AHEAD

If you don't think years ahead you may find yourself burdened with costly problems. For example: corrosion and scaling, deteriorated fans, exorbitant repair bills, days of down-time all caused by moist air continually pulled through the fan section. The way to avoid these future problems is to specify dependable *"Dri-Fan"* by RECOLD. *"Dri-Fan"* is the Evaporative Condenser that pushes *dry air* through the fan section, eliminates corrosion problems, gives you long trouble-free performance. Check the exclusive, patented RECOLD features and see why more and more the order is for *"Dri-Fan."* Available for Freon 12, Freon 22, and ammonia in capacities from 5 to 150 tons, single or multiple circuit installations.

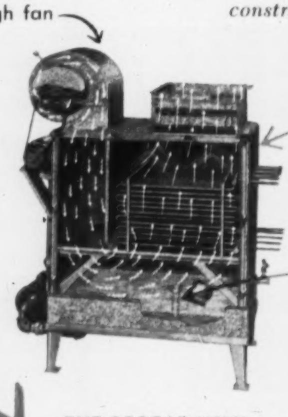
- ***Engineered for quiet operation***
- ***Galvanized construction***
- ***Desuperheat coil available***
- ***Easy to install and service***

"Dri-Fan" Cooling Towers provide the same advantageous construction.



THE OLD WAY

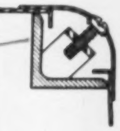
Highly saturated air is constantly pulled through the vulnerable fan section causing corrosion, scaling, deterioration of the fan, shaft and bearings.



THE RECOLD WAY

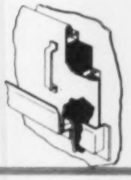
"DRI-FAN" ELIMINATES CORROSION PROBLEMS

RECOLD uses the forced draft principle to push dry air through the condenser. The fan operates in the dry air stream.



Think about serviceability—RECOLD advanced cabinet design provides water-tight panels that are quickly and easily removed.

Think about bleed control—RECOLD "funnel" design assures positive, non-clogging action with scale control and minimum water loss.



Think about accessibility—Patented access door slides easily, provides water-tight seal without use of gaskets or fasteners.

For illustrated folder on RECOLD "DRI-FAN" *Evaporative Condensers or Cooling Towers, write to your Recold distributor or to...*

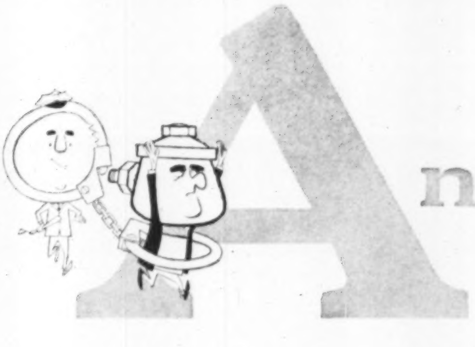
Recold

"DRI-FAN" Trade Mark registered

RECOLD

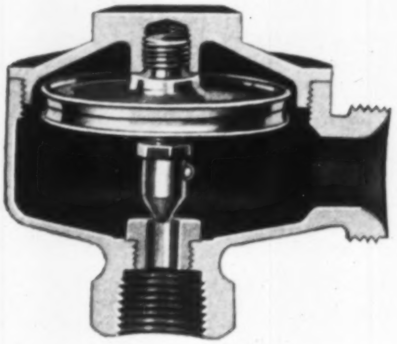
REFRIGERATION ENGINEERING, INC.
Department A-1
7250 EAST SLAUSON AVENUE, LOS ANGELES 22, CALIFORNIA

Question: *Are your radiator traps stealing steam?*



Answer: *Yes! If you continue to use traps that are steam-wasting and ineffective. Better check them now!*

Discard your inefficient traps and install **illinois** Replacement Traps to get top radiator efficiency.



FACTORY ADJUSTED, FACTORY TESTED, FACTORY GUARANTEED FOR SENSITIVE AND ACCURATE OPERATION.

Illinois Replacement Traps are not attachments, adapters, or interior assemblies, (the installation of which require time-wasting fitting in present traps with questionable results) but are complete traps the interior parts of which are identical with the nationally famous Illinois Series G radiator traps.

Made in a variety of patterns with roughing-in dimensions to fit practically all makes of traps. They are made to fit your present lock nut and tail piece. Your contractor can install them with minimum labor expense.

EASY TO ORDER—EASY TO INSTALL. TRAPS CARRIED IN STOCK FOR IMMEDIATE SHIPMENT.

Consult the representative nearest you in our nationwide service or write for descriptive literature.

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DIVISION OF AMERICAN AIR FILTER COMPANY, INC.

40

reasons why any service requiring BRONZE GATES can be planned for lasting economy

Look over the list of 40 patterns in Jenkins' complete line of Bronze Gates. You'll find the valve you need in this new folder, with details of the *extra value* design and construction that makes Jenkins the best buy for any service. Get this folder, use it to plan your hookups for lasting valve economy.

FOR ANY SERVICE---THERE'S A JENKINS BRONZE
THAT WILL LOWER MAINTENANCE---LAST LONG
40
DIFFERENT GATES TO VALVE SATISFACTION
125 lb. 150 lb. 200 lb. 300 lb. 350 lb. PATTERNS
including
SOLID WEDGE
SPLIT WEDGE
INSIDE SCREW
OUTSIDE SCREW AND YOKE
STATIONARY SPINDLE
TRAVELING SPINDLE
SCREW IN BONNET
BOLTED BONNET
UNION BONNET
QUICK OPENING
SOLDER END
SOCKET END
plus RADIATOR, HOSE END and UNDERWRITER GATES
SOLID WEDGE TRAVELING SPINDLE
SOLID WEDGE SCREW IN BONNET TRAVELING SPINDLE
SOLID WE SCREW IN BO STATIONARY S
SPLIT WEDGE UNION BONNET TRAVELING SPINDLE
SOLID WEDGE UNION BONNET TRAVELING SPINDLE
SOLID WEDGE OUTSIDE SCREW & YOKE RISING SPINDLE
SOLID WEDGE OUTSIDE SCREW & YOKE RISING SPINDLE
SWINGTITE FAST ACTION LEVER GATE
SELECT THE GATE YOU NEED FROM THIS COMPLETE ASSORTMENT
SOLID WEDGE BRONZE GATES
SPLIT WEDGE BRONZE GATES

Jenkins
BRONZE GATE VALVES

GET THIS NEW BRONZE GATE FOLDER

Call your Jenkins Valve Distributor or write: Jenkins Bros., 100 Park Ave., New York 17. Ask for Form 181-C

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VALVES
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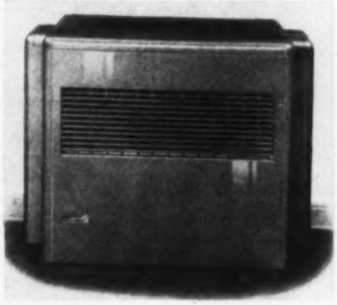
Jenkins Bros

SOLD THROUGH LEADING DISTRIBUTORS

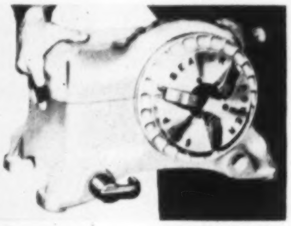
EQUIPMENT DEVELOPMENTS

For reviews of Recent Trade Literature see Page 314



Heating, Cooling Unit . . .

. . . for installation in hotels, office buildings, hospitals, etc.—Mueller Climatrol Div., Worthington Corp., 2005 W. Oklahoma Ave., Milwaukee 15. Room type conditioner has self contained air cooled cooling unit with built-in heating coil which operates off of central steam or hot water system. Installed through wall, is known as type "920" recessed air conditioner. Measures 30 in. high, 32½ in. wide; protrudes into room 15½ in. Cited features: provides individual thermostatic control of heating, cooling in every room; can be installed without disturbing tenants; selector switch permits adjustments for cooling and dehumidifying, forced air heating, ventilation with outside air, exhausting stale room air; requires no water, piping or drain.

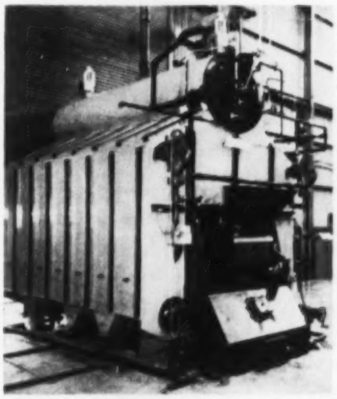


Power Drive . . .

. . . of aluminum construction with improved design—Beaver Pipe Tools, Inc., Warren, Ohio. Cited features: gears fully enclosed, lubricated for life of machine; wrenchless chuck works both forward, reverse; motor accessible without dismantling machine; operating switch protected against oil, weather; motor well ventilated for greater power, lower upkeep. Available with 110 or 220 volt universal motor.

Air Conditioners . . .

. . . in two lines for 1956—O. A. Sutton Corp., 1812 W. Second St., Wichita, Kan. For window installation, "Deluxe" line in ½, ¾, 1½ hp models, "Custom" units have ¾, 1, 2 hp.

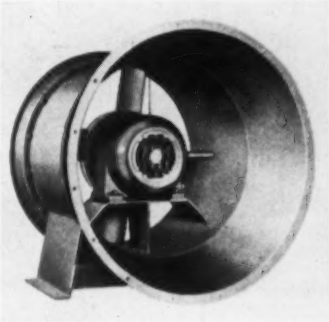


Packaged Boiler . . .

. . . with 12,500 lb per hr of steam capacity—Superior Combustion Industries, Inc., 1475 Broadway, New York 36. Designed primarily for coal firing, is also equipped to use oil and gas. Is prototype of standardized design for future Navy shore installations requiring capacities 10,000 to 25,000 lb per hr of steam, says company. Packaged design is said to reduce field assembly costs.

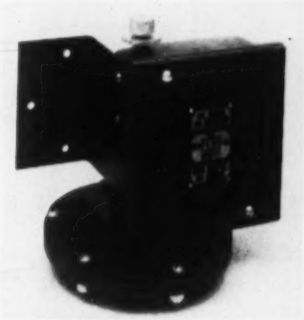
Auxiliary Tank Kit . . .

. . . for heavy volume work in furnace cleaning, other cleaning jobs where large wet and dry tank capacity needed—Premier Co., 755 Woodlawn Ave., St. Paul 1. Includes attachments necessary to convert standard 30 gal waste can into auxiliary tank. These are hose adaptors, swivel attachment nut and ring, curved tube, curved swivel tube, gaskets, bolts and nuts.



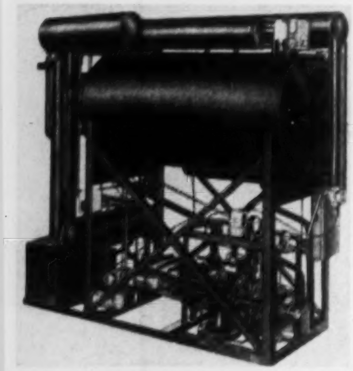
Axial Fans . . .

. . . for industrial ventilation, air supply—American Blower Corp., Detroit 32. Cited features: universal mounting, space economy, straight line air flow, low installation cost. With cylindrical casings to allow installation in ducts requiring minimum of space. Series "203" in four types: direct drive tubeaxial, direct drive vaneaxial, v belt drive vaneaxial, v belt drive spraybooth.



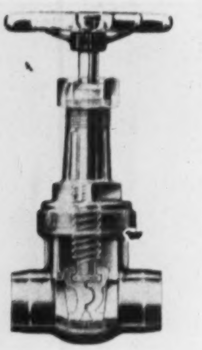
Vacuum Switch . . .

. . . designed for high sensitivity, ease of adjusting point of operation—Coral Designs Div., Henry G. Dietz Co., 12-16 Astoria Blvd., Long Island City 2, N.Y. For use on very low vacuum where regulation required in inches of water. Finds wide application as air vacuum interlock switch in equipment requiring safeguards to assure specific vacuum to prevent hazardous conditions, says company. For use in combustion equipment, air conditioning, industrial applications, etc. Rated 15 amperes at 120-250 volts, a-c, ⅛ hp or 125 volt ampere pilot duty.



Water Chiller . . .

. . . with its own operating controls—Servel, Inc., Evansville, Ind. 25 ton steam operated model. Requires only steam, water connections plus 115 volt electric line to operate controls, says company. Controls, regulated by thermostatic bulb in chilled water line, are said to provide continuous automatic modulation to meet varying load conditions. Capacity automatically reduced as low as 50 per cent of rating with corresponding reduction in steam consumption.

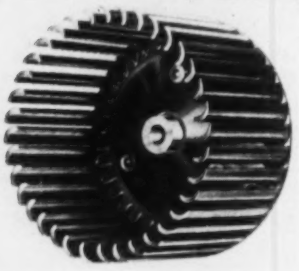


Valves . . .

. . . in five bronze solder-end models—Lunkenheimer Co., P.O. Box 360, Cincinnati 14. Line includes three gate valves: rising stem with double wedge disc, rising stem with solid wedge disc, nonrising stem with single wedge disc. All rated 125 psi steam, 200 psi water, oil, gas. Bronze swing check valve with renewable disc and side plugs carries same pressure ratings. Line completed by nonmetallic disc globe valve rated 150 psi steam, 300 psi water, oil, gas.

Silver Alloys . . .

. . . formulated to solve problems in welding dissimilar ferrous and nonferrous metals—All-State Welding Alloys Co., Inc., 249-55 Ferris Ave., White Plains, N. Y. Designed for joining aluminum, copper, brass, bronze, stainless steel, monel, combinations of these and other metals. In two types with melt and flow points in medium temperature range. Nos. 105 and 107 have 18,000 and 20,000 psi shear strengths, respectively.



Blower Wheel . . .

. . . with molded plastic construction, one piece design—Denbo Engineering and Sales Co., Inc., 3301 Martindale Ave., Indianapolis 18. Provides increased performance, greater quietness, close balance tolerance; is corrosionproof and light in weight, says company. Blade lengths on both single and double inlet types can be supplied to custom fit any application.

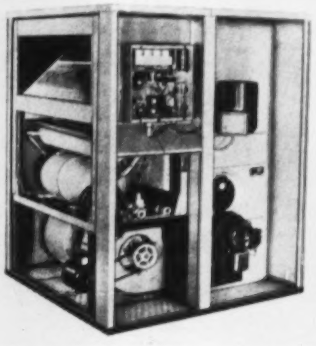
Thermostat . . .

. . . for furnace ducts and other warm air applications—Stevens Mfg. Co., Lexington, Ohio. Snapaction, bimetal disc type. For operation to 300 F. Rated at 25 amperes at 120-240 volts, a-c noninductive; $\frac{1}{2}$ hp at 120-240 volts, a-c; 345 volt amperes for pilot duty. In two basic styles, exposed or enclosed.

Pullman
NEVER-CLOG

Vacuum Cleaner . . .

. . . for furnaces—Pullman Vacuum Cleaner Corp., 25 Buick St., Boston. "Never-Clog" resists clogging through use of specially designed secondary filter. Also resists soot, soot acids, alkalies, rot, mildew and is fire resistant, says company. Comes with complete set of attachments.



Air Conditioner . . .

. . . for year 'round use—C. A. Olsen Mfg. Co., Elyria, Ohio. Five ton capacity cooling system, 175,000 Btu input heating system incorporated in same cabinet. Cooling system charged, hermetically sealed at factory. Is comprised of 5 hp, gas cooled, hermetic compressor; capillary tube metering device; large area, fin-on-staggered-tube cooling coil; water cooled, shell and fin tube compressor; modulating, automatic water control valve. Unit can be fired for heating with gas or oil burner. Adaptable for small commercial applications.

Pressure Gage . . .

. . . for determining available air pressure at point of use—U. S. Gauge Div., American Machine and Metals, Inc., Sellersville, Pa. Has 2 in. di-

An Important Scientific Contribution
by the National Bureau of Standards
A Law of Appreciating Returns

The Law of Diminishing Returns in Heat Resistance, which affects so many building materials, has been found to be offset by a Law of Appreciating Returns which applies to parallel, reflective spaces.

The *importance* of this LAW will be felt in terms of winter and summer comfort in every kind of building, in fuel conservation, air-conditioning, cold storage. The practical and simple application of this LAW, *at very low cost*, will be about 8¢ per sq. ft. area of top floor ceilings and outer walls.

The findings of H. E. Robinson and F. J. Powlitch, under the direction of R. S. Dill, all with the National Bureau of Standards, were recently published by the Housing and Home Finance Agency in a booklet entitled "The Thermal Insulating Value of Air Spaces, Housing Research Paper 32."

Their findings show that for heat flowing *up* and *laterally*, successive reflective parallel air spaces, follow a law of appreciating returns.

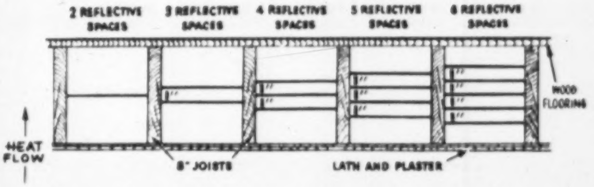
THE EXPLANATION OF THE LAW

If the *temperature difference* between bounding surfaces in an air space is decreased, there follows a significant decrease in convection, which is particularly important in up and lateral heat flow.

Such decrease can be attained, for instance, by dividing 8" ceiling joist spaces with aluminum sheets so they form successive reflective air spaces.

Here's a simple experiment! Assume the depth of one 8" joist space is divided in half by an aluminum sheet; another such space divided in 3 parts by 2 such sheets centered 1" apart; the next space divided in 4 parts with 3 sheets; the next in 5 parts with 4 sheets; another in 6 parts with 5 sheets.

Assuming the original 8" space has a *temperature difference of any fixed amount*, the more the space is divided, the greater is the *division of the original spread of temperature;* so EACH SPACE CARRIES A SMALLER BURDEN OF TEMPERATURE DIFFERENCE. There follows a *decrease* in convection and a corresponding significant increase in the insulating value of the spaces. This holds true down to space depths of about 1", below which the diminution in insulating value due to increase in conduction because of lessening the depth, becomes the controlling factor.



It was found that *each* 1" reflective space where the joist-space was divided in 6 parts, had greater insulating value than each 1" space where the joist-space was divided in 5 parts; which in turn had greater value than each 1" space where there were 4 subdivisions, etc. The total insulating value in an 8" joist space of 6 such reflective spaces was *more than twice* that of 3 such spaces, more than 50% better than 4 such spaces.

The Thermal Factors below were calculated by Infra engineers, with the use of Research Paper 32. The ceiling joist space was taken as 7⅝" deep; wall stud space 3⅝"; floor joist space 9⅝". For 5 and 6 space side heat flow, 5⅝" stud space was used. The roof was taken as asphalt shingles or roll roofing on 25/32" solid wood sheathing. Air temperatures were assumed as follows:

	Heat Flow	Inside Temp. °F	Outside Temp. °F	Mean Temp. °F	Temp. Diff. °F
Walls	side	70	0	35	70
Ceilings	up	80	10 (attic)	45	70
Ceilings	down	90	120 (attic)	105	30
Floors	down	65	30	48	35

THERMAL FACTORS FOR PARALLEL REFLECTIVE AIR SPACES

(In Btu per sq. ft., per hour, per degree F)

Where Dividing Media are ALUMINUM with .03 emissivity, and PAPER, spaced 1" apart.

Calculated on the basis of work done by the **NATIONAL BUREAU OF STANDARDS** For Housing & Home Finance Agency's Research Paper No. 32

Number of REFLECTIVE SPACES	UP-HEAT C FACTOR	UP-HEAT U FACTOR Attic Floor (roof excluded)	UP-HEAT U FACTOR Ceiling & Roof (unfloored attic)	DOWN-HEAT C FACTOR	DOWN-HEAT U FACTOR Attic Floor (roof excluded)	DOWN-HEAT U FACTOR Ceiling & Roof (unfloored attic)	DOWN-HEAT U FACTOR Floor over Crawl Space	SIDE-HEAT C FACTOR Wall	SIDE-HEAT C FACTOR Wall
4 REFLECTIVE SPACES 2 aluminum sheets 1 paper sheet .... ⅞" apart	.106	.084	.082	.035	.032	.032	.039	.069	.057
5 REFLECTIVE SPACES 3 aluminum sheets 1 paper sheet .... 1" apart	.082	.068	.066	.031	.029	.028	.033	.051	.044
6 REFLECTIVE SPACES 3 aluminum sheets 2 paper sheets .... 1" apart	.067	.058	.056	.029	.027	.027	.028	.043	.038

For a free copy of this very important scientific work, send coupon below.

Infra Insulation, Inc., 525 B'way.
New York, N. Y., Dept.
Please send "Research Paper No. 32"

NAME

FIRM

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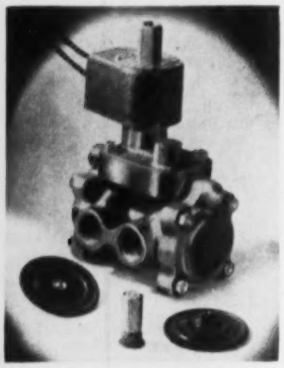
ameter. Is equipped with hypodermic needle, guard. Permits tapping air hose at tool, thus determining pressure available at tool regardless of original pressure or number of tools on line, says company.

Instrument . . .
. . . for measuring oxygen, combustibles in exhaust gases—Instrument Div., Davis Emergency Equipment Co., Newark. Designed to meet testing requirements of combustion processes. Measures 18 × 12 × 18 in. Weighs 35 lb. Oxygen measured by catalytic combustion, employing disposable container of propane. Combustibles measured in separate cell, indicated on individual meter.



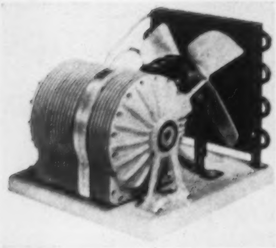
3-Way Solenoid Valve . . .
. . . with new design, operation—Automatic Switch Co., 391 Lakeside Ave., Orange, N.J. Internal pilot operated "Bulletin 8316" valve uses three operating parts—two hycar diaphragms, one stainless steel solenoid core. Is said to operate under severest conditions to 400 cycles per min. Converts from normally closed to normally open operation. Mounts in any position. In 3/8 or 1/2 in. pipe connections. Rated for 250 psi on liquids, gases.

Booster Pumps . . .
. . . for water circulating systems—Piqua Machine & Mfg. Co., Piqua, Ohio. May be used as submersible pump or for surface (suction), applications. In six sizes 3/4 to 2½ in. for hot water heating in apartments, hotels, etc.

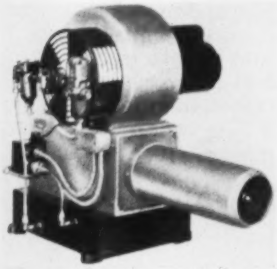
Capacitors . . .
. . . rated up to 20 percent above present units with same cross section—General Electric Co., Schenectady 5. Designed to help manufacturers meet this year's Underwriters' Laboratory requirements for room air conditioners. In ratings up to 15 uf at 440 volts, a-c; 20 uf at 350 volts, 23 uf at 330 volts. New unit shown at left.

Centrifugal Pump . . .
. . . classed as paper stock and industrial liquids type—Ingersoll-Rand Co., 11 Broadway, New York 4. Features diverging type impeller said to enable pump to handle liquids containing high concentrations of solids, air, gases. Impeller has greater area at discharge than at inlet. Is horizontal, single-stage unit. In sizes 4 to 12 in. Capacities 200 to 7000 gpm. Heads 5 to 225 ft.

Air Conditioners . . .
. . . with redesigned cabinets featuring separate discharge plenum—Brunner Mfg. Co., 1821 Broad St., Utica 1, N. Y. In 3, 5, 7½, 10 hp models. New design is said to make units smaller, more compact.

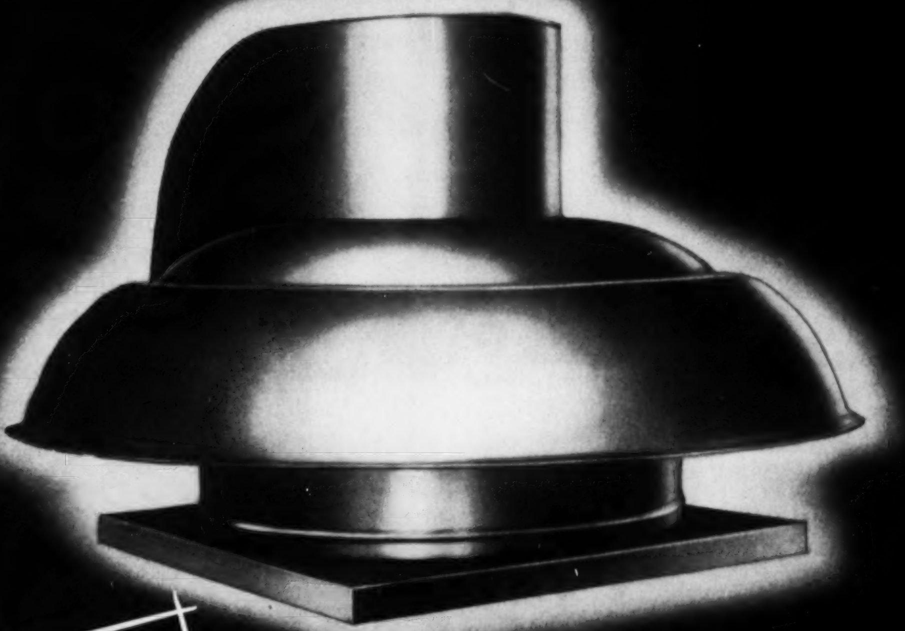


Hermetic Compressor . . .
. . . designed with space saving features—Harv-O-Metic Co., 3341 Cahuenga Blvd., Los Angeles. Cast aluminum shell (8½ × 6⅝ in.) provides housing for each of 1/8, 1/6, 1/4 hp models. Operates in either horizontal or vertical position.



High Pressure Burner . . .
. . . for No. 4 fuel oil—Sun-Ray Burner Mfg. Corp., 139-24 Queens Blvd., Jamaica 35, N. Y. For apartments, schools, institutions, commercial and industrial buildings, heating processes. Can be installed in any boiler or furnace, replaces existing No. 2 oil burners with little alteration, says company. In 3 to 6, 6 to 12, 10 to 20 gph models.

Polyethylene Pipe . . .
. . . with new identification marking—Chesflex Corp., Yonkers, N. Y. Each type (75 lb, 100 lb or standard), each size (½ to 4 in.) carries continuous message: "Chesflex—100 percent Virgin Polyethylene"—the size—the type—and a mark indicating each 2 ft.



new!

CENTRIFUGAL ROOF VENTILATOR
. . . WHISPER QUIET, LOW SILHOUETTE

For whisper-quiet operation. Running at low tip speeds, moves large volumes of air efficiently against static pressure. Low in silhouette, distinctively profiled, blends well with modern architecture. Send for new 16-page catalog which also contains a section, "How to Select a Roof Ventilator."

De Bothezat FANS
A DIVISION OF
American Machine and Metals, Inc.
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DeBOTHEZAT FANS, Dept. HP-156
Division of American Machine and Metals, Inc.
EAST MOLINE, ILLINOIS

☐ Yes, please send me catalog on your new Centrifugal Roof Ventilator.

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ATTENTION MR.

THE MARK OF QUALITY

BARBER COLMAN

Wheelco Instruments

New Flame-Protection System for Gas and Oil Burners Offers . . .

Advantages to your clients, Benefits to you, too!

Complete flame supervision with maximum protection against flame failure are important advantages your clients will gain when you specify Wheelco Flame-otrol electronic combustion safeguard systems.

FLAMEOTROL

There are specific benefits for you, too, in doing business with Wheelco. You deal with instrument specialists who are familiar with the problems that can arise in designing combustion safeguard systems. Wheelco's nationwide sales and service organization is prepared to offer engineering assistance as you need it. The Wheelco field engineer will help you select from a complete line of instruments and accessories, basing his recommendations on a realistic analysis of the requirements of individual jobs. Call him now!

WHEELCO INSTRUMENTS DIVISION

Barber-Colman Company

Dept. A, 1501 Rock Street, Rockford, Illinois

BARBER-COLMAN of CANADA, Ltd., Dept. A, Toronto and Montreal, Canada

EQUIPMENT DEVELOPMENTS

Continued

Dehumidifiers . . .

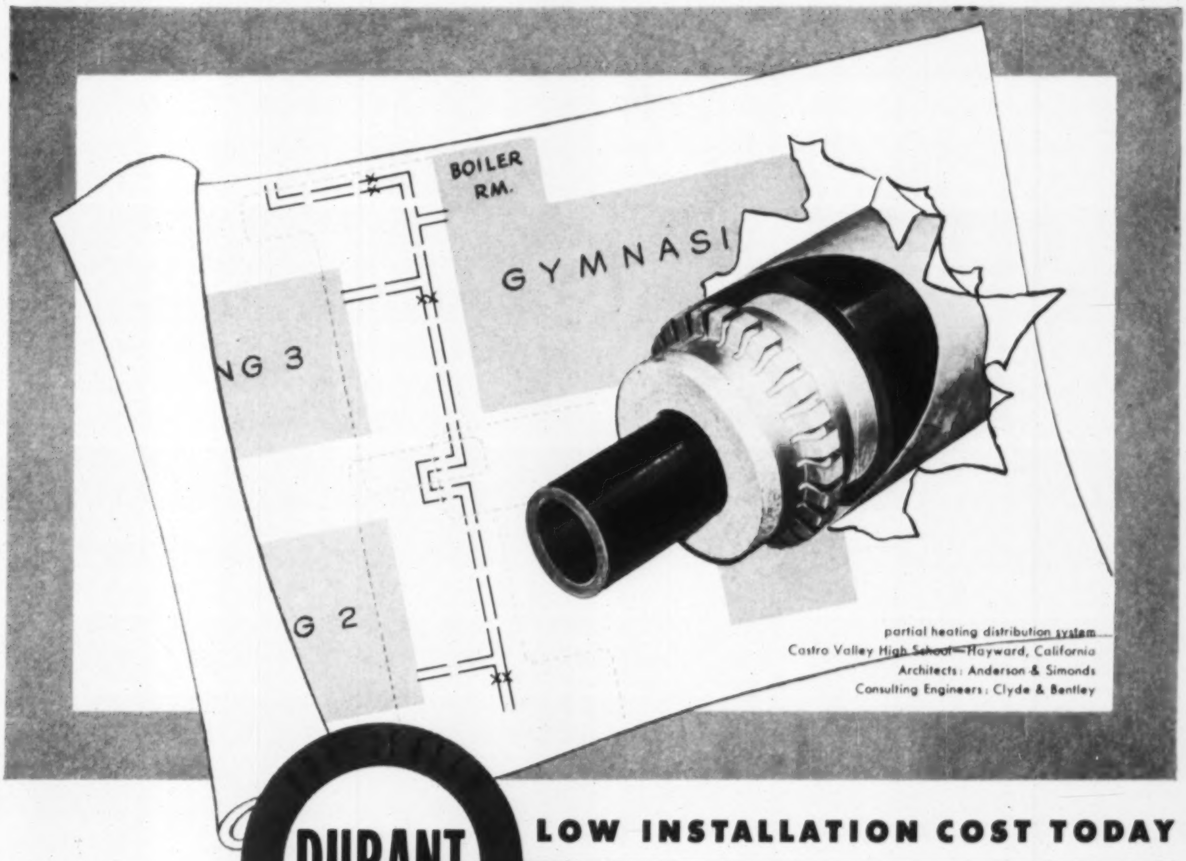
. . .featuring heavy construction, accessibility, ease of maintenance—American Blower Corp., Detroit 32. Central station, sprayed coil type. Special access door to air output end designed to provide quick access to coils, drain trough, tank in that area. Coils, eliminators removable. Spray nozzles, float valve, strainer, coil face, drain troughs, tank accessible through air inlet end. Units available in standard arrangements. Capacities range 2300 to 45,900 cfm.

Blower . . .

. . .with new design concept—Lau Blower Co., 2001 Home Ave., Dayton 7. "Electro-Wheel" is direct drive blower with $1/4$ hp motor mounted completely within blower wheel. More efficient absorption of noise, vibration obtained by use of stationary shaft, rubber encased on both ends, says company. Gives air deliveries 500 to 1500 cfm, static pressure 0.5 to 1.25 in. water gage.

Relay . . .

. . .for general purpose use with wide application range—Ohmite Mfg. Co., 3681 Howard St., Skokie, Ill. Insula-



partial heating distribution system
Castro Valley High School—Hayward, California
Architects: Anderson & Simonds
Consulting Engineers: Clyde & Bentley

DURANT

LOW INSTALLATION COST TODAY
LESS MAINTENANCE COST TOMORROW

Expanding school populations across the nation focus increasing attention on costs and on Durant factory-prefabricated insulated pipe systems.

ORIGINAL COST is low with D.I.P. The packaged increments of conduit and standard fittings are rapidly field-joined, with only the pipe itself requiring a weld. No concrete tunnels, masonry, special underground supports, or sub-drains are needed.

CONTINUED COST is less with D.I.P. Its integral layer of non-porous asphalt completely waterproofs the insulation, and prevents corrosive elements from reaching the pipe. Even complete submersion is harmless! Maintenance-creating manholes, expansion joints and other devices can be eliminated by use of standard D.I.P. expansion fittings.

54-PAGE D.I.P. CATALOG #35 GIVES COMPLETE DETAILS, WRITE FOR IT.

D.I.P.* STAFF ENGINEERS AND REPRESENTATIVES IN PRINCIPAL CITIES AND IN CANADA ARE AT YOUR SERVICE D.I.P.*

Western Manufacturing Division
DURANT INSULATED PIPE COMPANY
PALO ALTO • CALIFORNIA

Eastern Manufacturing Division
DURANT INTERNATIONAL CORPORATION
WILLIAMSTOWN • NEW JERSEY

*Trademark

"The Pritchard LoLine is 7 ways better than what?"

"Seven ways better than competition."

"*Which* competition?"

"*Any* competition!"

"That expression has always bothered me in advertising. I just had to call you on it."

"Bothers me, too."

"Well, what are the seven ways?"

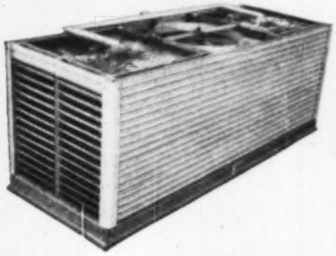
"First, it's the lowest silhouette tower. It has galvanized steel fan drive supports, not less durable painted steel. Grease fittings for the V-Belt drive bearings are on the outside; easier to get to. Then, corrugated rather than flat asbestos cement board casing gives a more attractive appearance."

"That's four."

"Let's see. Five, asbestos cement board louvers are standard, not special equipment. Then, with the LoLine, you get an internal pipe supply system. Piping is concealed. Last, the V-Belt drive has a stainless steel fan shaft. Lasts far longer."

J. F. PRITCHARD & CO. OF CALIFORNIA
4625 Roanoke Parkway, Kansas City 12, Mo.

"The Pritchard LoLine is 7 ways better than what?"



PRITCHARD LOLINE® HAS LOWEST SILHOUETTE OF ANY TOWER 75 TONS AND UP!

The Pritchard LoLine Tower is the lowest silhouette tower of all. Just 7', 7¹¹⁄₁₆" over-all height. Thus, it best meets the needs of architects in planning for suburban or metropolitan buildings.

Besides that, the LoLine has:

- **Select Heart redwood or better in all framework. Framework is surfaced, machine fabricated for precision fit.**
- **Each set of louvers has slip-fit inserts of cement asbestos board, individually removable.**
- **Simple drive design, ruggedly supported by hot-dip galvanized structural members.**
- **Complete line of accessories.**

SEND FOR COMPLIMENTARY COPY OF LOLINE® BULLETIN

Describes many unique design features in detail. Cross-sectional drawings. Photographs of construction features. Capacities. Optional equipment. Write today—on your company letterhead for this bulletin!

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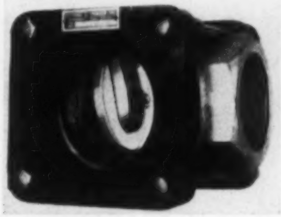
OF CALIFORNIA
A DIVISION OF J. F. PRITCHARD & CO.
Dept. 467, 4625 Roanoke Parkway
Kansas City 12, Missouri

COOLING TOWERS • GAS & AIR TREATING EQUIPMENT
REPRESENTATIVES IN PRINCIPAL CITIES FROM COAST TO COAST

EQUIPMENT DEVELOPMENTS

Continued

tion is of molded phenolic material. Contact rating is 15 amperes at 155 volts, a-c or 32 volts, d-c noninductive load. Is said to be capable of handling power loads usually demanded of larger, heavier relays.



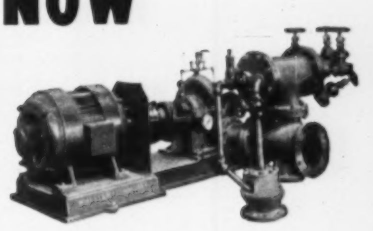
Sight Flow Indicator . . .

. . .combining flow indication with positive check of back flow—Fischer & Porter Co., 544 Jacksonville Rd., Hatboro, Pa. Has self aligning soft seat flapper said to prevent back flow. Two windows on opposite sides of body fitting show whether or not there is flow. Indicator does not measure rate of flow. Primarily designed for LP gas and anhydrous ammonia service. In sizes for 2 and 1½ in. pipe with pressure ratings 250 and 300 psi, respectively.

Motor Starter Coil . . .

. . .with "dual seal" design—Furnas Electric Co., 1041 McKee St., Batavia, Ill. Coil encased within molded modified epoxy resin to resist combustion, moisture, fungus, temperature, rough handling. Starters with dual voltage coils matched to dual voltage motors. Coil changing virtually eliminated, says company, stocking of coils, starters simplified. For example, on 3, 7½, 10 hp starters, one 220-440 volt coil used where six are normally required.

PROVIDE FOR FIRE PROTECTION NOW



with a

WHEELER-ECONOMY FIRE PUMP

A delay in the planning or completion of your fire protection program may mean loss of life, property or operation. For a complete and effective plan include one or more Underwriters Laboratory and Factory Mutual Fire Insurance Companies approved Wheeler-Economy Fire Pumps.

Write for catalog **L-154**

WE-510

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C. H. WHEELER MANUFACTURING CO.
19TH AND LEHIGH, PHILADELPHIA 32, PA

BEFORE YOU BUY ANY STEAM TRAP...

LOOK INSIDE THE CASE!

YOU'LL FIND FIVE ECONOMY FEATURES EXCLUSIVE WITH SUPER-SILVERTOPS

GUIDED BUCKET. Inverted bucket is guided on a patented center-tube. Results in longer life as bucket cannot become damaged. Guarantees positive leakproof seating of valve.

EASIER INSTALLATION. Only Super-Silvertops can be installed straight in line or as an elbow in any size. Conventional bottom-inlet traps require more fittings and longer installation time.

ECONOMICAL SERVICING. Instead of removing trap from a pipe-line, you can open and service a Super-Silvertop in the line, since all connections are in the head.

SUPERIOR DESIGN. Super-Silvertops have simplified piping without thin-walled passages. Other traps have built-in piping which results in narrow, hard-to-clean passages that cause gaskets to blow.

ANDERLOY VALVE AND SEATS. Developed by Anderson to combat the erosive effect of steam. Eliminates replacement of valve and seat assemblies.

THE NEW WAY Notice the simplicity and saving in fittings.

THE OLD WAY Notice how bottom inlet requires complicated piping.

FREE TRAP SELECTOR BOOKLET!
Tells how to select and install traps for all steam equipment. For your free copy, fill out and mail this coupon to:

The V. D. Anderson Co., 1949 W. 96th St., Cleveland 2, O.
A Subsidiary of Chesapeake Industries, Inc.

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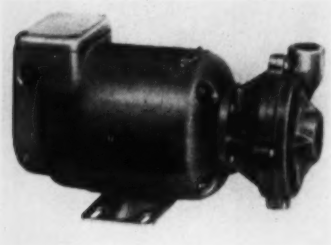
ANDERSON SUPER-SILVERTOP STEAM TRAPS
The Engineered Steam Traps

EQUIPMENT DEVELOPMENTS

Continued



1/20 Hp Pump . . .

. . .for use in closed, semi-closed, open systems—Ruthman Machinery Co., Cincinnati 2. Equipped with self adjusting, pretested seal. Can be mounted at any convenient point, regardless of position, says company. Discharge relation interchangeable in four 90 deg positions. Is said to be compact and simple in construction. Available in cast iron or bronze.

Air Conditioners . . .

. . .redesigned for 1956—Airtemp Div., Chrysler Corp., 1600 Webster St., Dayton 1. Packaged waterless and water cooled line has flush design, is available in 2 to 30 hp sizes. Shown is model "1008-2" water cooled unit.

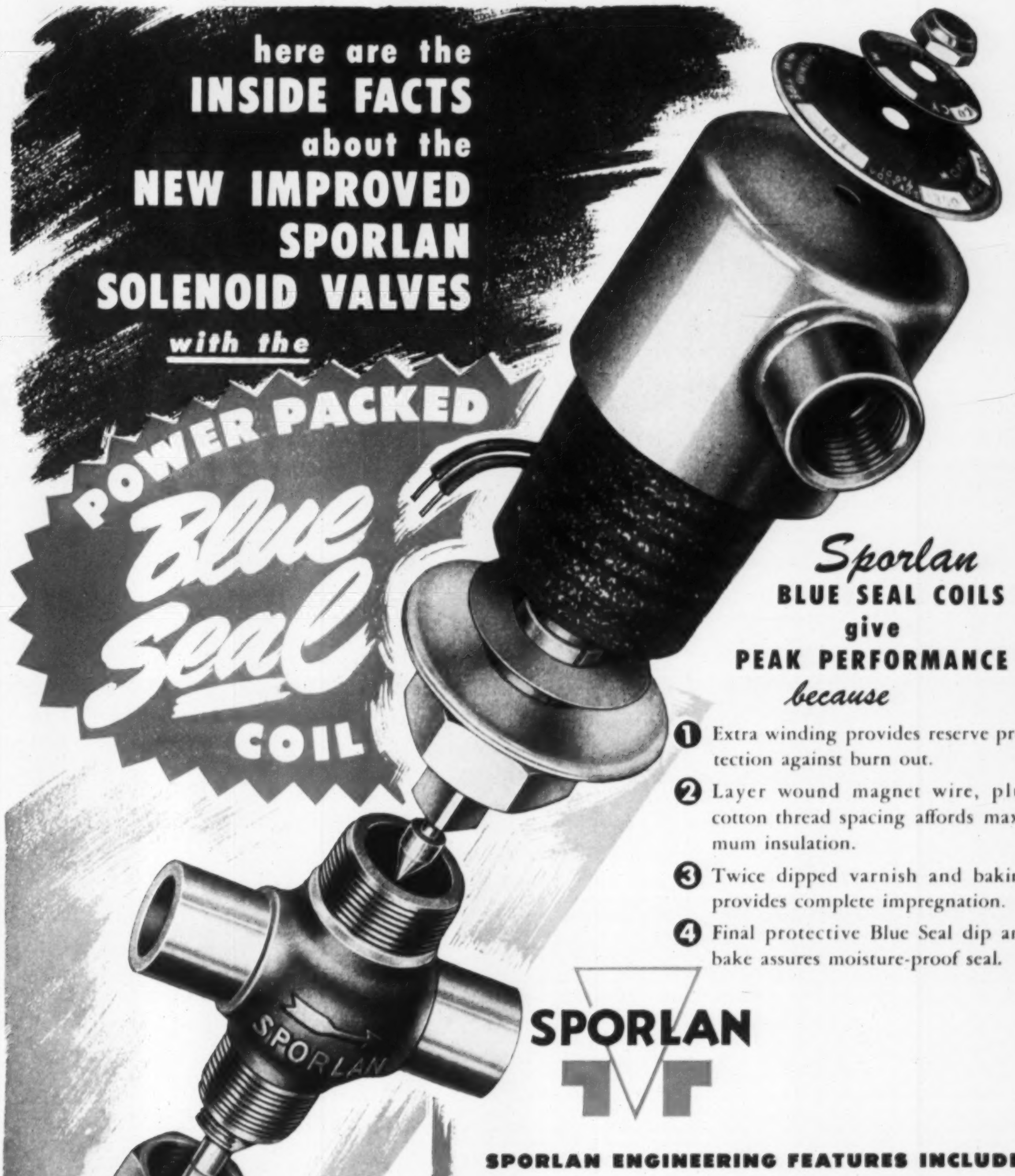
Optional Air Lift . . .

. . .new feature of "Reactivator" solids-contact clarifier—Graver Water Conditioning Co., 216 W. 14th St., New York 11. Available when required to replace mechanical recirculator. Unit is said to have wide application range in industrial, municipal, waste treatment fields. Most useful in installations requiring iron removal, says company.

here are the INSIDE FACTS about the NEW IMPROVED SPORLAN SOLENOID VALVES

with the

POWER PACKED *Blue Seal* COIL



For Peak Performance on all installations . . . buy Sporlan Solenoid Valves with the New Power Packed Blue Seal Coil . . . better still, Buy Sporlan Right Down the Line!

Sporlan BLUE SEAL COILS give PEAK PERFORMANCE *because*

1. Extra winding provides reserve protection against burn out.
2. Layer wound magnet wire, plus cotton thread spacing affords maximum insulation.
3. Twice dipped varnish and baking provides complete impregnation.
4. Final protective Blue Seal dip and bake assures moisture-proof seal.

SPORLAN

SPORLAN ENGINEERING FEATURES INCLUDE:

Extremely simple design — Few Parts . . . Sturdy — Take apart construction . . . Floating type stem and plunger assembly . . . Tight Closing — Pin and seat polished to a super finish . . . All large capacity pilot piston operated solenoid valves are equally applicable to both Freon-12 and Freon-22 . . . Tighter closing is assured — New synthetic seating now available in Types - 43 - 53 and 73 . . . Interchangeability of Coils — One size Blue Seal Coil fits 5 different type valves . . . All sweat type connection valves are now delivered hand tight — saves valuable time in removing internal parts before applying valves to the system . . . A new universal mounting bracket for all Sporlan Solenoid Valves.

SPORLAN VALVE CO.

7525 SUSSEX AVENUE ST. LOUIS 17, MO.
EXPORT DEPARTMENT: 89 BROAD STREET, NEW YORK 4, N. Y.

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A curtain of warm air is projected downward, preventing the icy blasts from entering.

They go into action as soon as the doors are opened, putting a curtain of warm air between the cold outside and the inside of the building, preventing the chilling blasts from entering. Workers stay healthy, are happier and keep right on working with the doors open. Learn how easily Wing Door Heaters can be installed in your plant. Send coupon for bulletin.

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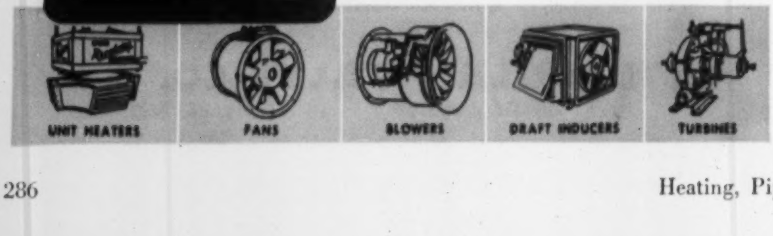

EQUIPMENT DEVELOPMENTS

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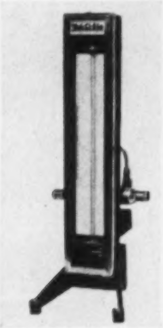
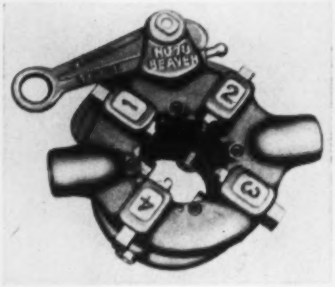


Gas Flowmeter . . .

. . . designed to linearly indicate directly in volumetric flow units—National Instrument Laboratories, Inc., 6108 Rhode Island Ave., Riverdale, Md. Assembly comprises linear flow element coupled with manometer. Flow element is made up of set of flow channels in which streamlined flow has been established so that differential pressure produced is proportional to volumetric flow. Cited advantages: accurate linear scale indication; low overall pressure drop; true volumetric flow indication independent of density; accuracy down to zero flow. For use at pressures 1 in. Hg absolute to 2000 psig with full scale flow ranges from 0.003 cfm for most common gases.



Pipe Threader . . .

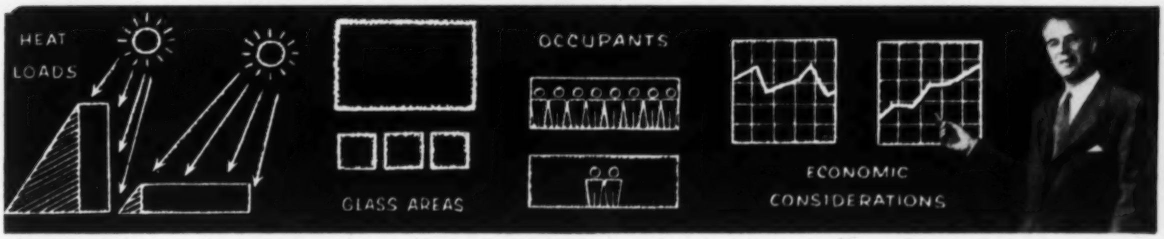
. . . designed for use with any power drive—Beaver Pipe Tools, Inc., Warren, Ohio. Threads 1, 1¼, 1½, 2 in. with one set of dies. Has no lead screw. Provides quick opening die throw-out. Can be set in any position, open or closed, says company. Dies are of thick design to absorb heat, stand up under constant operating pressure.

Superb in design, striking in appearance, New York's Colgate-Palmolive Building reflects the finest in materials to match its Yorkaire System of Air Conditioning. Bring this right kind of air conditioning into your building. Call your York District Office (listed in the classified phone directory of all major cities). Or write to York Corporation, York, Pa.

* * *

Two York Turbo Water Cooling Systems, totaling 1800 tons of refrigeration capacity, supply cooling for 1400 Model CF Yorkaire Conditioners. Owner and General Contractor—Uris Brothers; Architect—Emery Roth & Sons; Consulting Engineer—Henry Oehrig; Mechanical Contractor—Raisler Corporation.

You'll discover a "new concept" of air conditioning in New York's Colgate-Palmolive Building



Heat loads and glass areas and number of occupants and floor areas, economic considerations and taxes and depreciation and operating costs—all these factors (and still others) influence the choice of an air conditioning system for a large building. And since these factors vary from building to building, obviously no one system—or even two or three—can answer each building's needs best. That's why York carefully selects and then precision-engineers each Yorkaire System to fit its particular building.

This ability to meet each building's exacting specifications, to bring the *right kind* of air conditioning to any building, old or new—and to do it all at a reasonable price—appeals so strongly to our first-time customers that they call it a "new concept" of air conditioning. York's method is possible, not only because York Engineers have a great variety of quality Yorkaire Systems from which to select, but also because these men are highly skilled professionals in the science of air conditioning.

YORK CORPORATION

the quality name in air conditioning

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

Specify Raypak

Copper tube forced hot water boilers

...with exclusive gas modulation —sizes the boiler for the job!

Approved by A.G.A.

Complies with A.S.M.E. code

12 Models fit every need

Check these features

Raypak boilers are specifically packaged for Radiant Panel, Baseboard, Radiator, Convector, Swimming Pool and Volume Hot Water Supply Systems and also are ideal companions to Air Conditioning Units.

1. Original "Plug-in" Boiler
2. 100% copper waterways last a lifetime
3. Triple the BTU's per pound of weight
4. Remarkably compact and durable
5. Laboratory tested at 2,000 psi—no failure

Raypak's skilled and specialized distributors and representatives are available any time for consultation on any wet heating problem.

Raypak

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Engineers-Manufacturers
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El Monte, California

Please send me additional information and name of local representative.

Name____________________

Occupation____________________

Company____________________

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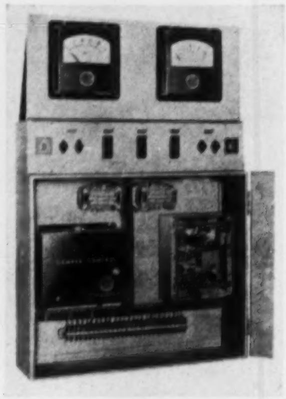
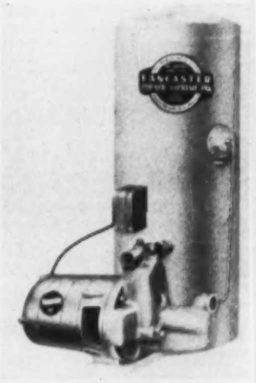


Panel Control Systems . . .

. . . for automatic burners—Combustion Control Div., Electronics Corp. of America, 718 Beacon St., Boston. Are said to offer complete burner protection, fully automatic operation for commercial, industrial oil, gas, combination burners. Flame failure safeguard, programming control, short circuit protection, motor starters, fuel selector switches, signals, alarm combined as single unit. Optional equipment includes sequence draft controls, draft and temperature indicators, provision for switching to modulated or fixed-rate firing.



Centrifugal Jet Pump . . .

. . . for shallow well use—Lancaster Pump and Mfg. Co., Lancaster, Pa. Has hydraulic characteristics enabling it to deliver 840 gph at 5 ft suction lift against 20 psi, says company. Will be made available with complete range of factory packaged water systems in 1/3 and 1/2 hp models, manufacturer reports.

FOR QUIET PERFORMANCE...

use Chicago Airfoil Fans

Its aerodynamically designed blades reduce noise level 65%, cut horse power requirements 35%. Capacities, 600 to 1,000,000 cfm.

Write for Bulletin A-102

CHICAGO BLOWER CORP.

9869 Pacific Ave., Franklin Park, Ill

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No. 75
MAIN VENT AIR VALVE
WATER LINE OF BOILER

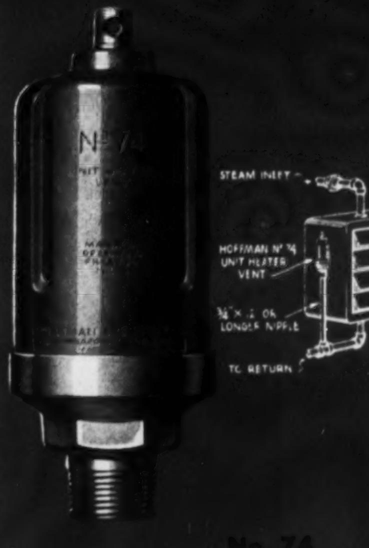
No. 75 STEAM

The steam main must be hot first so that the heating system will get the maximum amount of heat in the miminum amount of time. The No. 75 vent with its large venting capacity lets the air out of the main permitting the heating units to function at their greatest efficiency.

Size connection ¾" male, ½" female. Max. operating pressure 10 lbs.

THE BIG 3

HOFFMAN MAIN VENTS



No 74
STEAM INLET
HOFFMAN No 74 UNIT HEATER VENT
¾" x 12 OR LONGER NIPPLE
TO RETURN

No. 74

FOR STEAM UNIT HEATERS

Steam Unit Heaters must be "piping hot" to give best results. The smallest amount of air must be eliminated as fast as it accumulates. The No. 74 vent was designed to meet the unusual air problems in steam unit heaters. This vent will operate with rising, dropping or steady pressure.

Vents 300 Cu. In. of air per minute at 1 lb. and 800 C.I.M. at 10 lbs. Size Conn. ¾" male, ½" female. Max. Operating Press. 50 P.S.I.

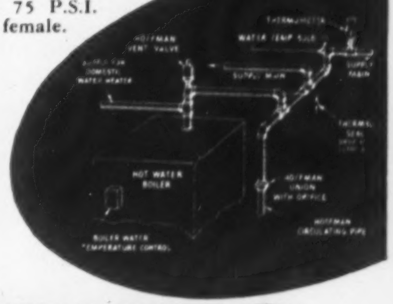
No. 79

WATER VENT

For good circulation on any water system it is necessary to let the air out. The No. 79 with its special float mechanism and rugged construction vents the air from the mains on Hot Water Heating Systems—Domestic Water Systems—Summer-Winter Units—Industrial Processes.

Tapped at the top for ¼" pipe connection to conduct away moist air.

Max. Operating Press. 75 P.S.I. Size Conn. ¾" male, ½" female.



HOFFMAN VENT VALVE
THERMOMETER
WATER TEMP. BULB
SUPPLY MAIN
HOT WATER BOILER
HOFFMAN UNION WITH ORIFICE
HOFFMAN CIRCULATING PIPE
BOILER WATER TEMPERATURE CONTROL

To get top performance on Steam Unit Heaters, Steam Heating Systems, Steam Process Work, Hot Water Heating Systems, Domestic Water, Summer-Winter Units—Water Process work, air must be eliminated from the mains. The "Hoffman Big 3 Main Vents" are designed to vent the air accumulations in the main so that the equipment will function effectively.

Installation of these main vents now on old or new jobs will insure the maximum efficiency of the equipment.

HOFFMAN MAIN VENTS

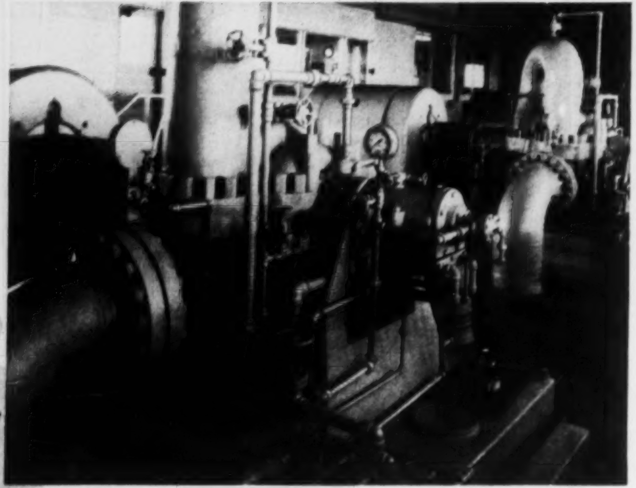
HOFFMAN SPECIALTY MFG. CORP.

VALVES, TRAPS, VACUUM AND CONDENSATION PUMPS, FORCED HOT WATER HEATING SYSTEMS

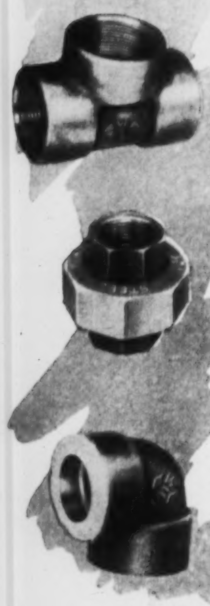
1700 West 10th St., Indianapolis 7, Ind.

Sold by leading Wholesalers of Heating and Plumbing Equipment

WATSON-STILLMAN
FORGED STEEL FITTINGS



WORK BEST...under pressure



In high pressure steam lines . . . process liquid and gas piping . . . hydraulic fluid lines . . . wherever strong, tough pipe joints are needed, Watson Stillman Forged Steel Fittings provide a safety factor against costly piping failures. They resist pressure, heat, corrosion, shock and vibration because they're drop-forged of high quality steel to produce a dense, tough, forged-fiber structure that can really take it.

Extra strength is built into W-S fittings in other ways too . . . such as the heavy reinforcing bands extending well beyond the threads or sockets.

Protect your high pressure piping system with Watson-Stillman Forged Steel Fittings. Available in carbon, stainless and alloy steels, in Screw-End and Socket-Welding Types to meet your service requirements. Send today for Free Catalogs.

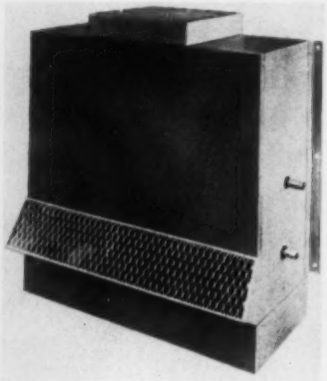
Bulletin A3-50—Forged Steel Fittings
Bulletin S-1-55—Stainless and Alloy Fittings
Bulletin U-1—Forged Steel Unions
Bulletin S-3-55—150 lb. Stainless Fittings

Sold Through Leading Distributors

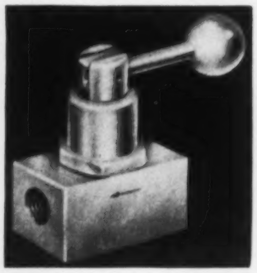
WATSON-STILLMAN FITTINGS DIVISION
HKP H. K. PORTER COMPANY, INC.
Roselle, New Jersey

EQUIPMENT DEVELOPMENTS

Continued



Evaporative Condenser . . .
. . . designed for small commercial, other low tonnage applications—Refrigeration Engineering, Inc., 7250 E. Slauson Ave., Los Angeles 22. In 2, 3, 4, 5 ton sizes. Is said to offer advantages of low head pressure, economical operation.



Shutoff Valve . . .
. . . with toggle operated design—James-Pond-Clark, 2181 E. Foothill Blvd., Pasadena 8, Calif. For liquid or gas at pressures to 3000 psi. Resilient O-ring is said to provide positive, leakproof shutoff. Can be used in either hydraulic or pneumatic service. May be panel mounted.

Water Heater . . .
. . . for small commercial use—A. O. Smith Corp., Box 584, Milwaukee 1. Model "B-180" booster heater has glasslined tank, 8 gal capacity. Recommended by company for providing sanitizing rinse water in restaurants. Has 50,000 Btu per hr rating, 42 gph recovery. Measures $30\frac{1}{2}$ in. high to fit under counters, in odd corners.

Therm-O-Tile

CONDUIT FOR UNDERGROUND PIPING

• *PERMANENT* • *ECONOMICAL*
• *SIMPLE* • *EFFICIENT*

The four diagrams at the right — Figures 1, 2, 3 and 4 — make it clear how simple and easy it is to install Therm-O-Tile and why it remains a PERMANENT job when once installed.

This unsurpassed conduit has been thoroughly tested by decades of service in many hundreds of installations. It has been brought to perfection by improvements through the years.

The vitrified tile envelope is one of the most permanent materials known to man. It is manufactured from the finest shale deposits in the United States. All tile sections are extra thick with integral air chambers giving it great strength with lightness in weight. Top sections are furnished without bells and provide a smooth surfaced conduit. The cement mortar used for jointing is locked into the cells and grooves in the tile, making joints which are flush, tight, and easily sealed with mastic.

ASK FOR BULLETIN 10154

This is only a PART of the Thermo-O-Tile story. To get the whole story — all data — photographs of installations — photos of details — ask for the latest bulletin.

TYPICAL INSTALLATIONS

Airports
Airplane Factories
Automobile Factories
Breweries
Central Heating Plants
Chemical Plants
Colleges
Conservatories
Cotton Mills
Experiment Stations
Factories
Gas Plants
Greenhouses
Hospitals
Housing Projects
Infirmaries
Medical Centers
Military Establishments
Museums
Power Stations
Prison Farms
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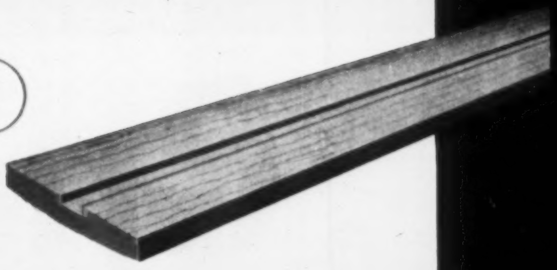
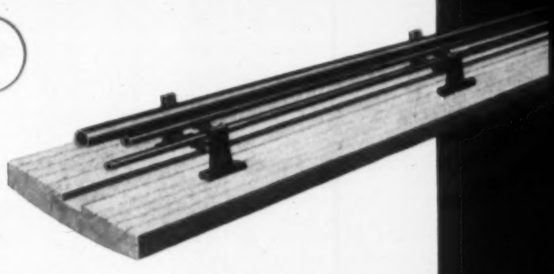


① **Pour the concrete slab**
② **Install the piping**
③ **Insulate the piping**
④ **Install the tiles and waterproof the mortar joints**

2



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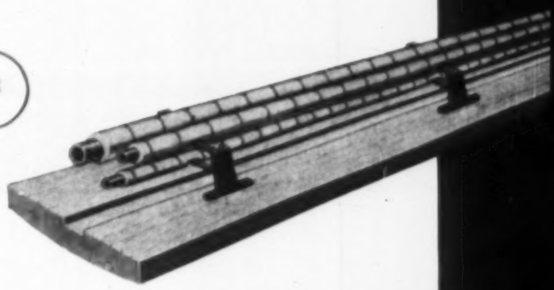

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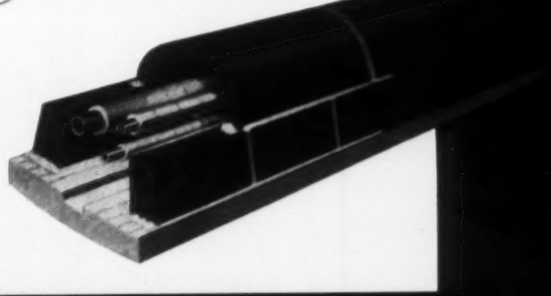


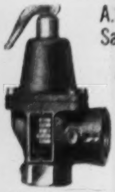
Since 1875

A Great Line Of.. Heating Specialties

HOT WATER HEATING SPECIALTIES

A.S.M.E. Rated Pressure Safety Relief Valves

Affords complete pressure protection for hot water boilers with a single valve. Available pressure settings 30 to 150 lbs.



N74 Size ¾"

N174 Series Sizes ¾" to 2" inclusive

135HW Sizes ½" ¾", 1"

Feed Water Pressure Regulators

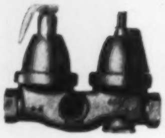
Feeds water to boiler at 10 to 15 lbs.

N39 Size ½"

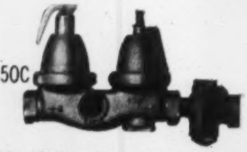
Dual Controls

Feeds water to boiler at 12 lbs. — Pressure relief at 30 lbs.

45A Deluxe construction Size ½"

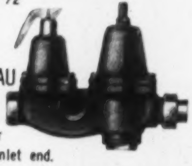


N450 Popular design Size ½"



N450C

Nos. N450C or 45AC have check valve and strainer

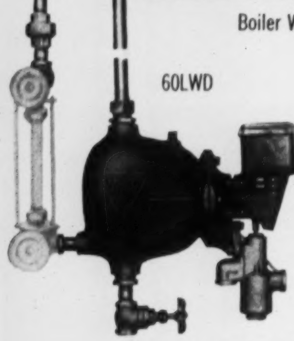


45AU

Nos. 45AU or N450U have sweat copper union applied to inlet end.

BOILER WATER LEVEL CONTROLS FOR LOW PRESSURE STEAM HEATING BOILERS

Boiler Water Feeders



60LWD

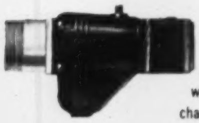
76LWD

Feeder cut-off combinations

SERIES	CONNECTIONS	CAPACITY	STEAM	WATER
60	½" gauge glass	up to 5,000 sq. ft. rad.	25 lbs.	150 lbs.
76	1" chamber, ¾" feed valve	over 5,000 sq. ft. rad.	35 lbs.	150 lbs.
81	1" chamber, ¾" feed valve	over 5,000 sq. ft. rad.	35 to 75 lbs.	150 lbs.

Low Water Cut-Offs

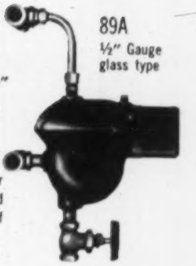
Maximum steam pressure 25 lbs.



101A Exclusive 2½" screw-in type with sediment chamber.

193A 2½" Screw-in type for use where shallow section and depth of jacket prevent use of No. 93A.

93A 2½" screw-in type



89A ½" Gauge glass type

50A 1" Float chamber connections for use on process boilers and hot water heating boilers. Max. steam press. 50 lbs.

Send for . . .
CONDENSED CATALOG No. 56
Complete listing of Watts Products

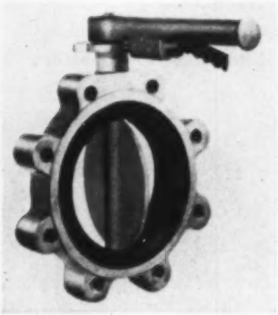
Send for . . .
FOLDER F-60
Boiler water level controls for heating and process steam boilers

WATTS REGULATOR COMPANY
LAWRENCE, MASSACHUSETTS

LARGEST AND MOST COMPLETE LINE OF ITS KIND IN THE WORLD

EQUIPMENT DEVELOPMENTS

Continued

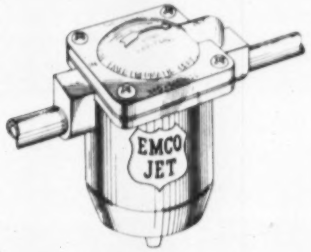


Butterfly Valves . . .

. . . with threaded bolt holes rather than drilled holes normally supplied on valves for use between flanges—Keystone Tool Corp., P. O. Box 6716, Houston. "Lug Type" has two sets of short bolts or cap screws to connect valve to flanges. With valve in closed position, design permits flange on either side of valve to be disconnected with full operating pressure held in line on opposite side, says company. In sizes 2 to 12 in. For use between standard ASA 125 or 150 lb flanges.

Gas Burner . . .

. . . added to company's gas fired heating and power equipment line—Iron Fireman Mfg. Co., Cleveland 11. "GBH-140" burner is horizontal inshot type, designed for firing with natural, manufactured, mixed, LP gases. Has AGA 60,000 to 140,000 Btu per hr input rating. For light commercial conversion heating. Has 4 in. diameter radiant flame spreader for installation directly through port opening in most oil fired furnaces, boilers.



Compressed Air Filter . . .

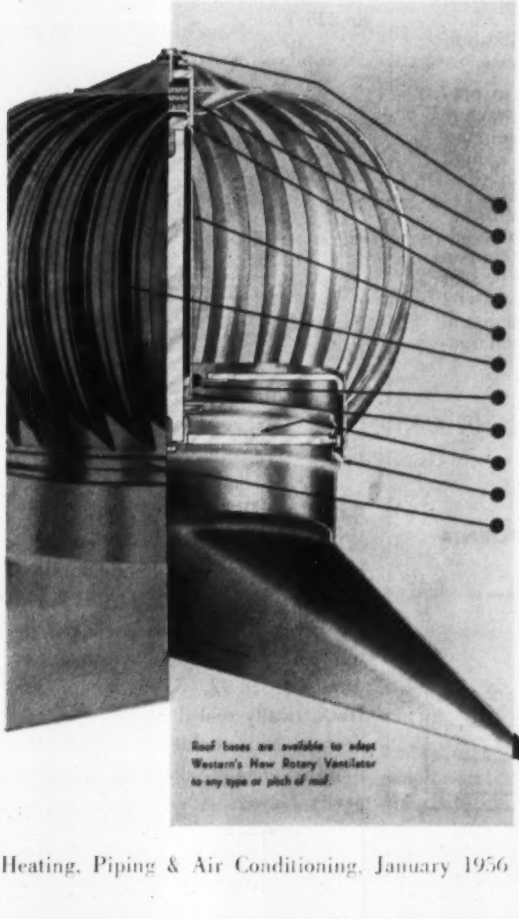
. . . with lightweight, self adjusting design for industrial use—Emco Pneumatic Corp., 1317-1319 Locust St., Des Moines, Ia. "Emco Jet" weighs 12 oz. Major parts are aluminum. Company cites "point-of-use" application as advantage. Is designed to eliminate sludge, abrasives, rust, scale, moisture from entering air operated tools.

Compressors . . .

. . . in 10 and 40 hp series—Brunner Mfg. Co., 1821 Broad St., Utica, N. Y. "NR" line redesigned and engineered for use with refrigeration condensing units. Speeds range 550 to 1070 rpm. Internal manifolding is said to facilitate better cylinder cooling, fewer flange connections with less possibility of leaks, lower center of gravity, less vibration. Pressure lubricated to spread oil to all bearing surfaces.

Iron Powder Electrode . . .

. . . designed for "all-position" use—Lincoln Electric Co., Cleveland 17. Is said to have advantages of higher speeds, ease of operation. Formulated for applications where universal type electrode needed. For either a-c or d-c welding current. Is said to pro-



Roof bases are available to adapt Western's New Rotary Ventilator to any type or pitch of roof.

NEW- INSIDE AND OUT

WEMCO'S newly engineered roof ventilator is not only strikingly new in appearance, but look inside, and there too, you will see that Western's Rotary is the newest and best answer to ventilating problems!

LOCKED-ON ROTOR prevents loss or damage in the highest winds, yet the ventilator is easy to disassemble without special tools.

BOX-GIRDER CONSTRUCTION is used for rigidity and permanent alignment.

WOOL-PACKED LUBRICANT RESERVOIR is oversized to ensure years of operation with minimum maintenance, under most severe conditions.

PATENTED* BEARING SUSPENSION — New radial thrust ball-bearing keeps friction loading so low that momentum keeps the head spinning even in sporadic winds.

PERMANENTLY SEALED WEATHERPROOF CASING protects upper and lower bearings from airborne dust and grit.

EXCLUSIVE CORRUGATED VANE DESIGN ensures rigidity, and prevents shipping damage.

SIX RUBBER MOUNTINGS completely isolate head from throat — no noisé or vibration can be transmitted.

SINTERED BRONZE RADIAL BEARING is oil-impregnated for minimum friction drag and long operating life.

NEW SUPPORT SPIDER ASSEMBLY—redesigned for greater strength and rigidity.

MINIMUM CLEARANCE BETWEEN BASE AND ROTOR prevents backdrafts or air spillage.

BAKED ENAMEL FINISH in soft sea-green hammertone—blends with any exterior, modern or traditional.

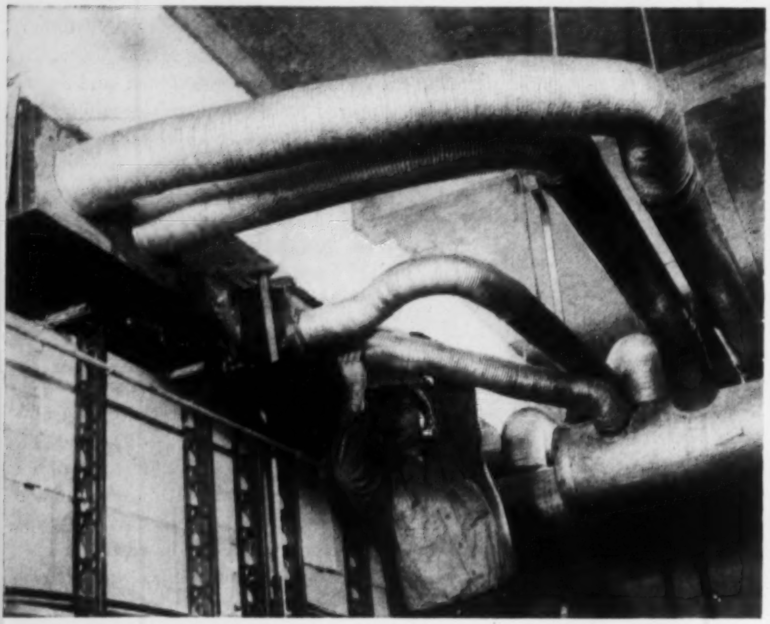
* PENDING

WESTERN ENGINEERING AND MFG. CO. IS THE ONLY MANUFACTURER OF ROTARY VENTILATORS WHO BACKS UP THEIR PRODUCT WITH AN UNCONDITIONAL GUARANTEE. FOR FURTHER INFORMATION ABOUT THIS EXCLUSIVE GUARANTEE, OR FOR THE NAME OF YOUR LOCAL REPRESENTATIVE, WRITE TO:

WESTERN ENGINEERING & MFG. CO.
4116 Ocean Park Ave., Venice, Calif.

HAVE YOU SENT FOR YOUR FREE VENTILATION NOMOGRAM?

Thermaflex: flexible ducting outperforms rigid ducting and installs faster at less cost



Whether it's a hot or cold air system, or both, you will find that you will save time and money when you use Thermaflex® high or low pressure flexible ducting as a connector to snake around bends and obstructions. You can forget about special elbows or costly connectors, for when you use Thermaflex one man, without special tools, can make the necessary connections in a matter of seconds.

You'll find, too, that Thermaflex is designed for the job. It is flameproof and waterproof and will give years of trouble-free service. Its use in a system reduces vibration and deadens air stream noises.

Thermaflex is engineered to provide excellent air flow characteristics and provides a minimum friction loss in bending around obstructions.

Write, today, for more information about this very useful product. Fill out the attached coupon and your information will be sent by return mail. Let us show you how you can save both time and money on your next air conditioning system.

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Flexible Tubing Corporation, Dept. 7, Guilford, Connecticut
Please send me more information on Thermaflex.
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Title and Company________
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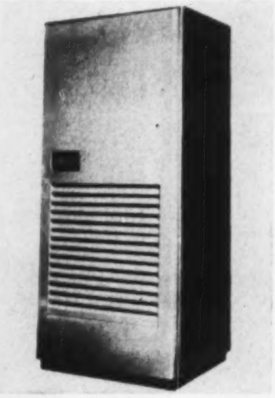
EQUIPMENT DEVELOPMENTS

Continued

duce up to 30 percent more inches of weld per electrode. Can be operated with drag or short arc technique. In sizes $1/8$ to 5/16 in. diameters.

Solenoid Valves . . .
. . . with "floating" diaphragm—Jackes-Evans Mfg. Co., 4427 Geraldine Ave., St. Louis 15. Design is said to provide greater fluid at lower pressure differentials. Are pilot operated units with no metal-to-metal contacts. For control of water, brine, air, light oils, industrial gas, "Freon 12 and 22," other noncorrosive fluids at 0 to 225 F.



Air Conditioner . . .
. . . in water and air cooled models—Union Asbestos & Rubber Co., Heating and Cooling Div., 332 S. Michigan Ave., Chicago. In packaged design for commercial installations. Available in 2, 3, 5 hp models. Hermetically sealed compressor, condensor, coils welded together. Has built-in plenum chamber, high capacity blower.

NO MORE NOISE

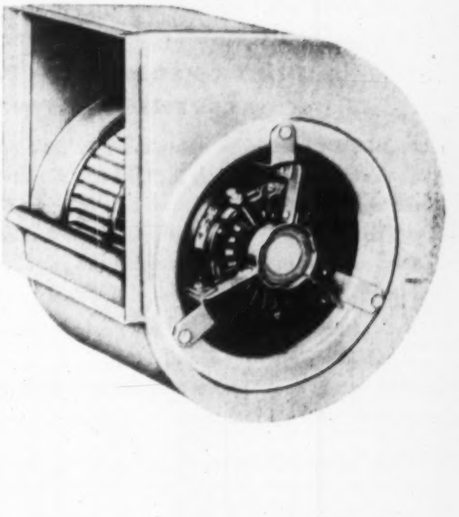
You can stir up quite a breeze with Utility's Direct Drive blowers without making a sound. The answer is in the Neoprene hubs which isolate motor noise and vibration. These hubs, a product of Utility's consistent engineering research, now an integral part of all direct drive blowers, are brought to you at no extra charge.

Utility Direct Drive Blowers are adaptable to the manufacture of heating, cooling, refrigerating and ventilating equipment. These blowers require less space, have no unnecessary accessories and can be speed controlled easily.

Noise it around among your customers – these new silent direct drive blowers are further evidence of Utility's top quality engineering and advanced production techniques. In addition to such exclusive features, Utility offers the combination of the best products in the field for the lowest cost.

Check Utility for blowers, blower parts or any combination of parts – and discover for yourself . . .

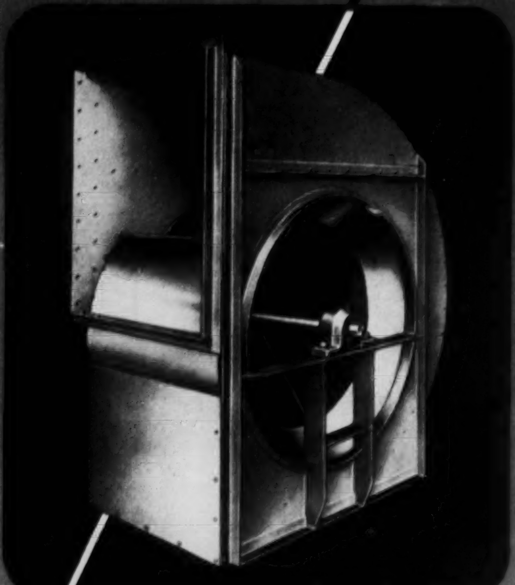
YOU CAN'T MATCH UTILITY FOR PRODUCT AND PRICE



A Division of Utility Appliance Corp.
UTILITY FAN CORPORATION
911 East 59 Street, Los Angeles 1, California

Producers of blowers and blower parts for original equipment manufacturers. Manufacturers of heavy and standard duty blowers for heating, air conditioning and ventilating installations. Write for catalogue data.

ALADDIN
FANS



for built-in quality

CERTIFIED RATINGS

AUTHORIZED BY NAFM

- **EFFICIENT**
- **QUIET OPERATING**
- **CERTIFIED RATINGS**

ALADDIN Series 94 Fans are available in 22 sizes of both backwardly inclined and forwardly curved types. Both types have been designed for the lowest rotational speeds consistent with high efficiency over the widest possible range of operating conditions.

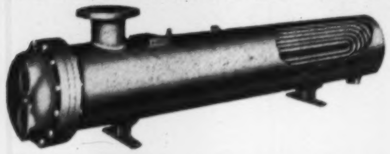
Each fan is ruggedly built... fully equal to the job for which it is designed, and is backed by twenty-five years of know-how in manufacturing all types of air handling equipment.

Write for complete data

ALADDIN HEATING CORPORATION
1111 WEST AVENUE 137 · SAN LEANDRO, CALIF.
REPRESENTATIVES IN ALL PRINCIPAL CITIES IN THE WEST

WHITLOCK
HEATING AND COOLING *Equipment*

✓ INSTANTANEOUS HEATERS



For use where hot water at a nearly uniform rate is desired. Type R shown has a removable U-tube bundle; other designs are available. Write for Bulletin 20A. Write for details on stock heaters.

✓ STORAGE HEATERS

Type K Storage heaters supply ample hot water at all times. Whitlock-Everdur construction assures lifetime service: Also made in Eterno and Standard Steel. See Bulletin 40A. Write for details on stock heaters.

✓ FUEL OIL HEATERS

Preheating promotes efficient atomization and burning. Type V-1 Heater shown is easily cleaned without breaking line connections. Whitlock heaters are made in a wide range of types and sizes. Ask for Bulletin 35.

✓ WATER CHILLERS

For Air Conditioning service Whitlock chillers are built to meet specific job requirements. The dry expansion cooler illustrated is of U-bend design; refrigerant passes through the tubes and cools water in shell — thus less refrigerant is required and danger of freeze-ups is greatly reduced. Ask for recommendations. Write for Bulletin 140.
Whitlock Engineering Service is complete — Bring your heating or cooling problems to us.

THE WHITLOCK MANUFACTURING CO.

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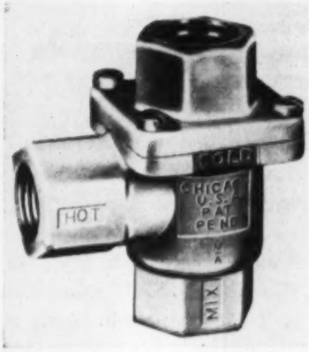
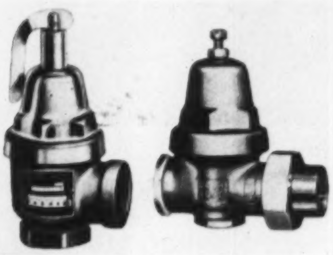


Water Mixer . . .

. . . designed to mix hot and cold water from storage tank, automatic water heater or tankless heater to maintain constant 140 F temperature—Dole Valve Co., Plumbing and Heating Div., 1933 Carroll Ave., Chicago 12. Power element is said to assure positive operation. No adjustment required in field.

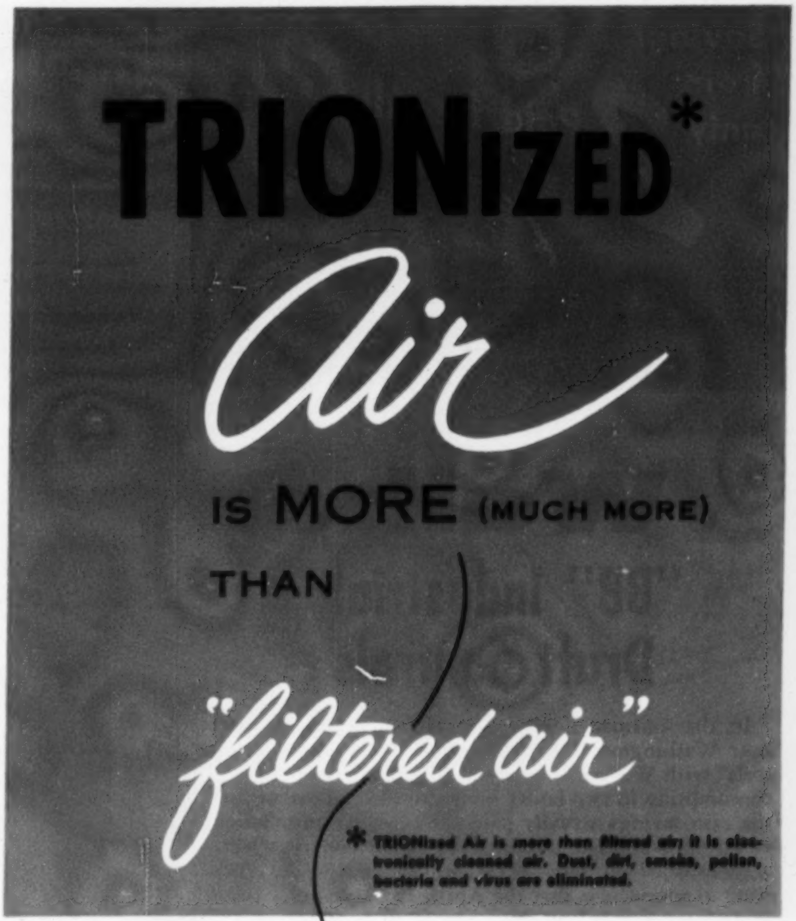


Two-Valve Package . . .

. . . for hot water space heating boilers—A. W. Cash Valve Mfg. Corp., 6621 E. Wabash Ave., Decatur 60, Ill. Unit consists of boiler feed control valve to keep pressure in system above 12 psi, safety relief valve to prevent dangerous over pressure.

Switching Valve . . .

. . . for use with dual pressure pneumatic control systems—Johnson Service Co., Milwaukee 1. Is said to have simple construction, is lightweight, is supplied with universal bracket for mounting in any position. "V-132" exhausting three-way valve switches automatically on dual supply pressure change, eliminating need for separate air line, says company.



* TRIONized Air is more than filtered air; it is electronically cleaned air. Dust, dirt, smoke, pollen, bacteria and virus are eliminated.

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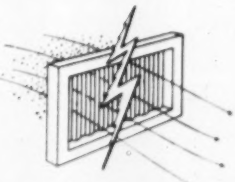
ELECTRONIC
AIR CLEANERS

TRION separates impurities from air *electronically* . . . delivering hygienically CLEAN air free of dirt, dust, smoke, pollen, bacteria and virus . . . guarding health at work and at home . . . cutting cleaning costs in stores and factories . . . preserving sanitation in hospitals and food processing plants. Trionized air goes far beyond filtered air—let us send you our complete Catalog E-60, free on request.



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Savings from only
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85
Astounding but true!

Read the facts on

Walker

"BB" Industrial Draft Controls

In the Fairmac Corporation Housing Development near Washington, D.C., replacement of existing "controls" with Walker "BB" Draft Regulators reduced fuel consumption in two boiler houses to such an extent that the cash savings actually paid for complete installation of all 85 Walker draft units! These fuel savings were accomplished in only *three months time*—and they were so spectacular that the April, 1953 issue of *Fueloil & Oilheat* devoted its lead article to a report of the complete details of the story! Reprints of this article are available upon request.

Walker "BB" Industrial Draft Controls can bring you the same kind of savings that the Fairmac Corporation is enjoying. Find out how by reading Walker's "Handbook of Draft Control for Industrial Installations." It gives the most complete facts ever assembled on control selection, proper location, capacities, installation and adjustment. This valuable handbook is absolutely free — and your request for a copy puts you under no obligation. Reserve your copy now—just send coupon below to:

A HANDBOOK of DRAFT CONTROL for INDUSTRIAL INSTALLATIONS

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Garage ☐
Other
____
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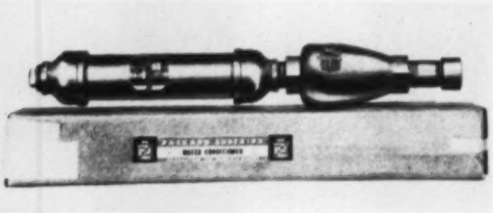
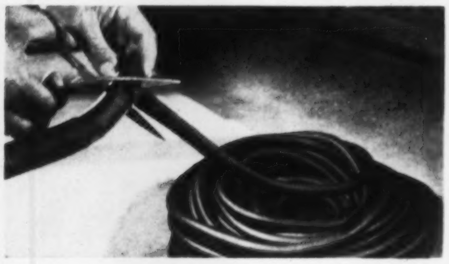


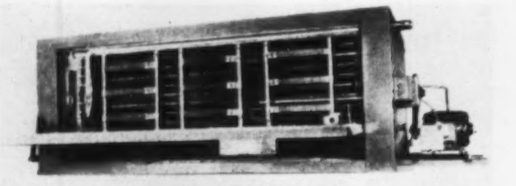
Water Conditioner . . .

. . . designed to eliminate scale, corrosion without using chemicals—Packard Water Conditioner Div., Inc., 2220 W. Beaver St., Jacksonville 9, Fla. Recommended by company for use on boilers, air conditioning and refrigeration systems, laundries, other industrial applications where water problems exist. Operates as application of nuclear physics principles by imparting added energy to the atoms of water solution. In sizes to handle 6.5 to 1760 gpm for connection with standard iron pipe sizes ranging $\frac{3}{4}$ to 12 in.



Tubing Insulation . . .

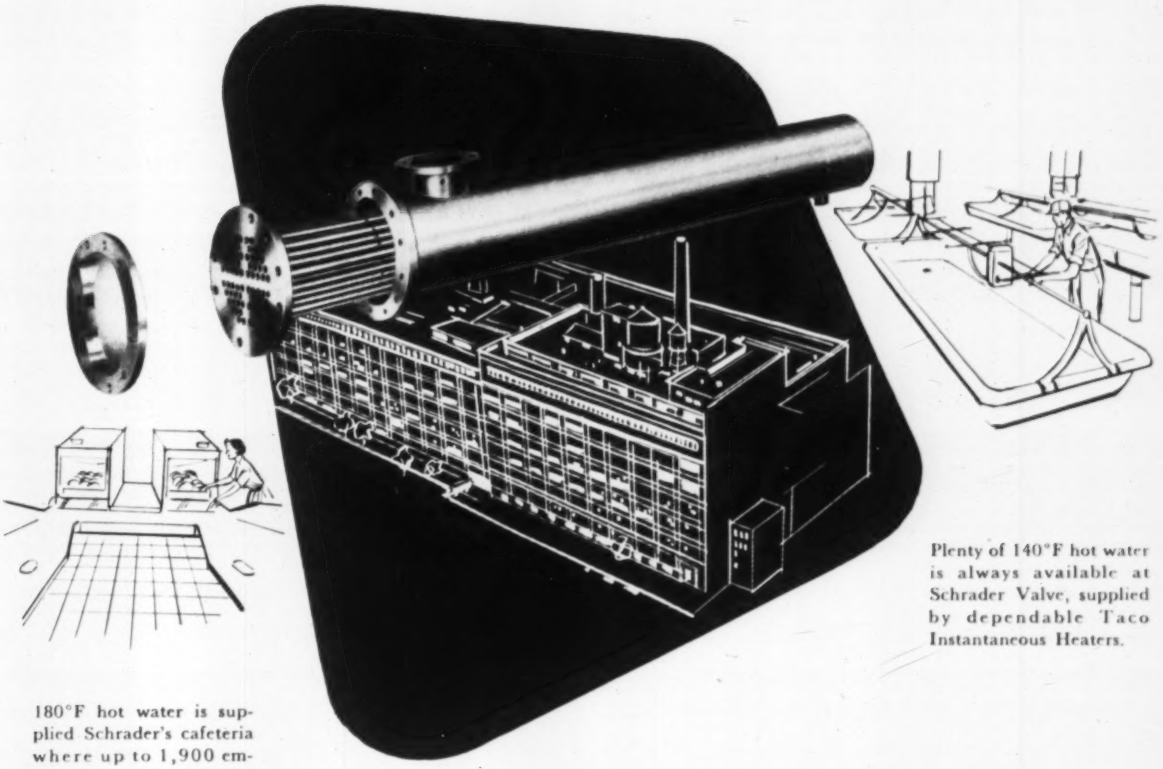
. . . of specially molded sponge rubber—Sponge Products Div., B. F. Goodrich Co., Shelton, Conn. Cited advantages: Will not absorb moisture; has high insulation value; will not support combustion; is easy to apply; has resistance to aging, shrinkage. "Cell-Tite" in standard outside diameters of $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ in. Can be made $1\frac{5}{8}$, $1\frac{3}{4}$, 2 in. In lengths to 50 ft.



Electric Defrost Unit Cooler . . .

. . . designed for low temperatures, automatic operation—Refrigeration Appliances, Inc., 903 Lake St., Chicago 7. During refrigeration cycle air is drawn over coil located in bottom portion of unit. Is then discharged out top-front portion. Air discharge opening designed for maximum air throw at low noise level. Defrosting accomplished through heat supplied by electric heaters. For use with Freon, ammonia, brine.

How would you heat 100,000 Gallons of water daily?



Plenty of 140°F hot water is always available at Schrader Valve, supplied by dependable Taco Instantaneous Heaters.

180°F hot water is supplied Schrader's cafeteria where up to 1,900 employees are served daily.

Here's how Schrader Valve Company does it!

They use 5 Taco Instantaneous Heaters. Every day of the year these 5 Tacos heat 100,000 gallons of water with 5 lb. live steam to 140° or 180°F. All Schrader hot water requirements . . . and there are *many* . . . are amply met by rugged, trouble-free Tacos *without a major repair in 18 years.*

Proof that you can depend on Taco to solve your hot water problem quickly, efficiently and economically. Write for Simplified Selection Chart today.

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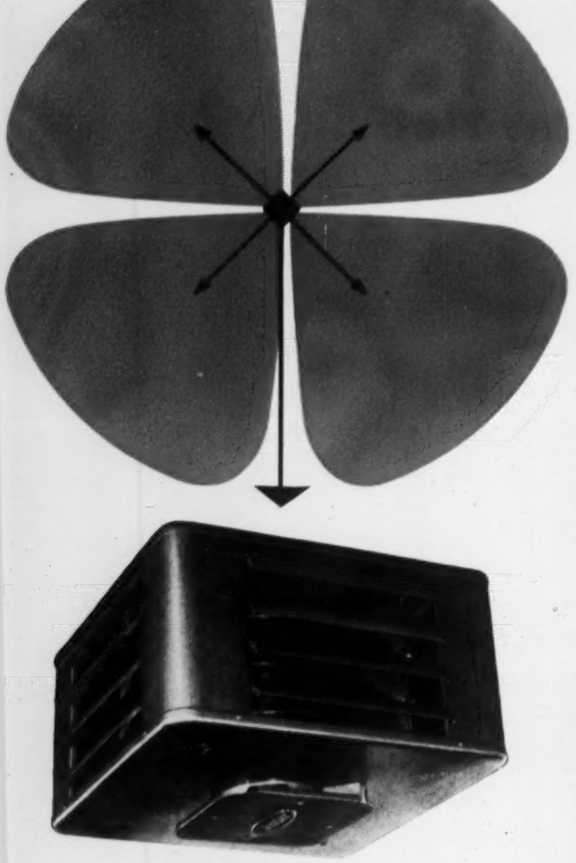


"Clover leaf" air distribution covers 1/5 acre with heat

For heating coverage, you can't beat Carrier's exclusive "clover leaf" pattern of air distribution.

Just one of the new 4-way Carrier Unit Heaters will spread hot air over 8500 square feet of floor space. Better than 3 conventional fixed outlets, projection-type unit heaters.

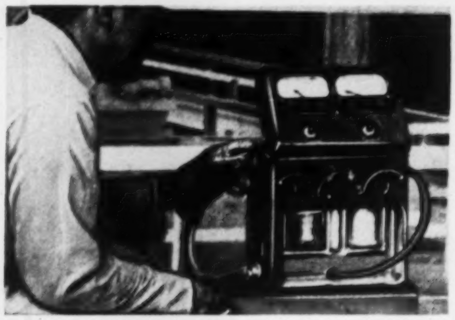
Simple adjustments vary the pattern. No outlet to change. No accessories to add.

Eight sizes for steam or hot water with ratings from 55,000 to 600,000 Btu/hr. Look in the Classified Telephone Directory for the name of your local jobber-distributor.

Carrier Knows Heating! Over fifty years of leadership in air conditioning have given Carrier unmatched experience in temperature control—heating and cooling! Carrier Corporation, Syracuse, New York.

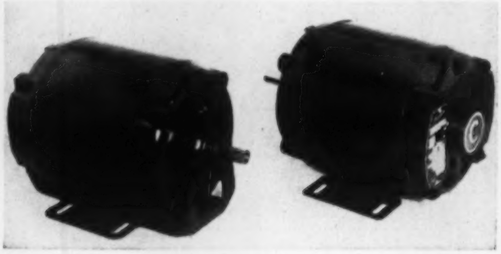
Carrier

air conditioning · refrigeration
industrial heating



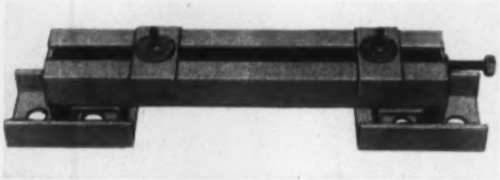
Combustion Analyzer . . .

. . .for oxygen, combustibles in flue gases—Bailey Meter Co., Cleveland. Portable instrument designed to conduct analyses of gas samples for oxygen, combustible gas content. Percents by volume indicated on instrument's meters. Unit includes sampling pump, hose and tip, thermocouple for measuring temperature. Operates on 110 volts, 25 to 60 cycles a-c. Meters have 4 and 20 percent range spans.



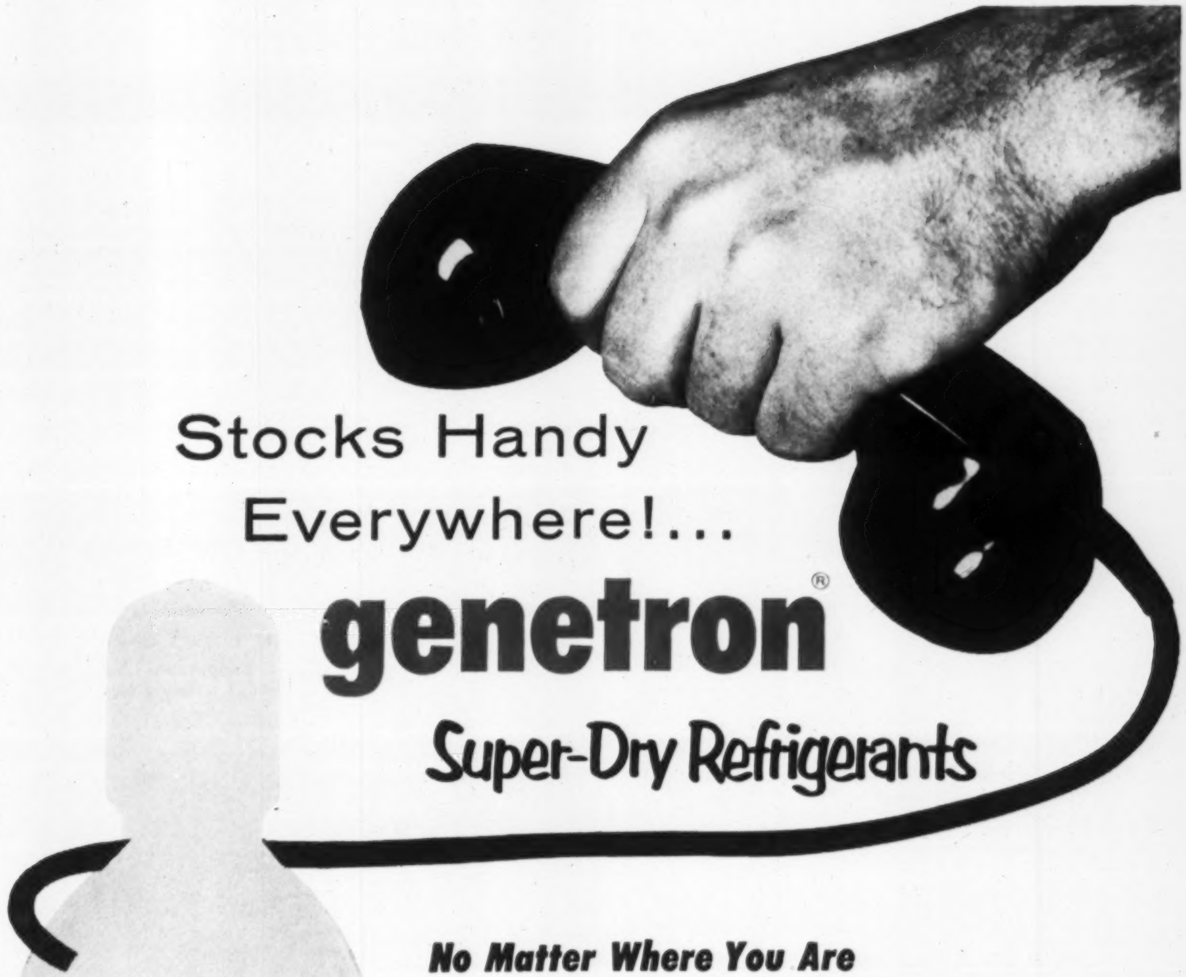
NEMA 48 Frame Fractional Hp Motor . . .

. . .in ratings for room coolers, fans, furnace blowers, oil burners, unit heaters, pumps, etc.—Century Electric Co., 1806 Pine St., St. Louis. In types such as split phase, permanent split capacitor, capacitor start, polyphase. Variations include open type, totally enclosed, enclosed "air-over," rigid base, cushion frame, flange mounted, double shaft extension, etc.



Motor Isolation Base . . .

. . .with built-in slide adjustment—Korfund Co., Inc., 48-01F 32nd Pl., Long Island City 1, N. Y. Mechanism is said to provide fast belt tensioning, simple installation, versatility of application. Eliminates need for separate slide base, slide rails. Permits user to use same base with broad range of motor sizes, says company. Six standard base sizes accommodate 29 different motor sizes.



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genetron 141 GREEN LABEL
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genetron 226 PURPLE LABEL
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Ask your wholesaler for new folder on "Genetron" Super-Dry Refrigerants. Contains pressure-temperature charts and other helpful information.

No Matter Where You Are

There's a genetron Wholesaler Near You!

Coast-to-coast, America's leading Refrigeration and Air Conditioning Wholesalers feature *"Genetron" Super-Dry Refrigerants.* There's one as near to you as your telephone ready to supply you with complete stocks of *"Genetrons"* and with up-to-the-minute data on their uses.

Remember—*"Genetron" Refrigerants* are super-dry! Their moisture content is exceptionally low; their over-all purity, extremely high. They meet the industry's most exacting refrigerant specifications . . . are freely interchangeable with comparable fluorinated hydrocarbon refrigerants produced by any other manufacturer. Follow the industry-wide trend to Super-Dry *"Genetrons."* Insist on *"Genetrons"* when buying refrigerants.

"GENETRON" DEPARTMENT
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.
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GC
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It's Tops

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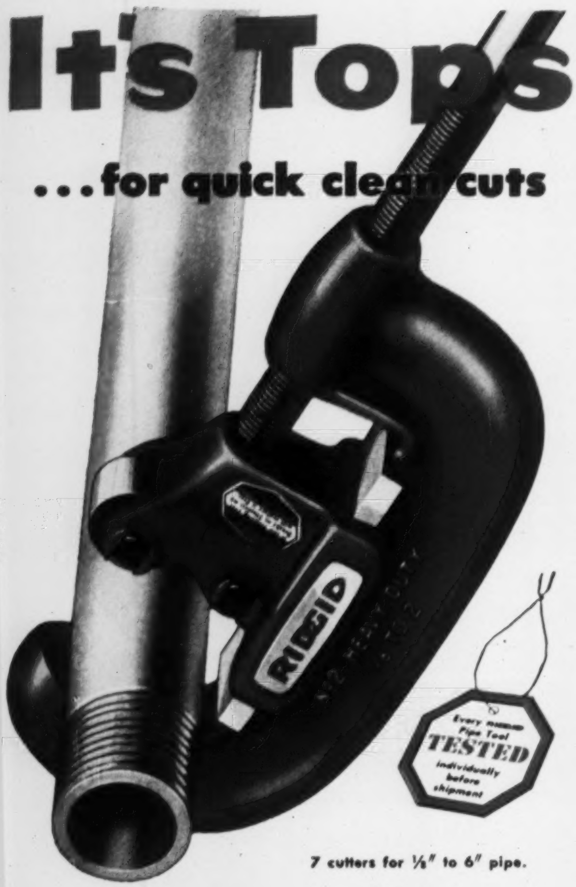
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No 2 HEAVY DUTY
Every RIDGID Pipe Tool TESTED individually before shipment

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Powerfully built—guaranteed not to warp or break, always tracks perfectly . . . Famous RIDGID thin-blade or heavy-duty cutter wheels of tool steel roll easily, cleanly through any pipe.* Every cutter factory-tested! Buy them at your Supply House.

*Special wheels available for stainless steel and cast iron.

For fast easy pipe cutting in tight places, RIDGID 4-wheel cutters.

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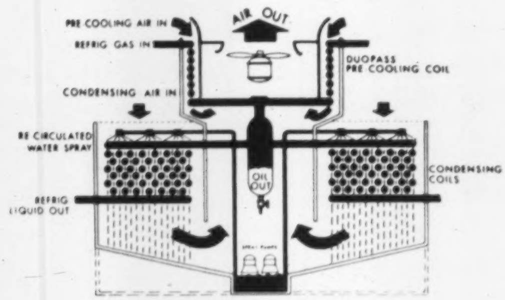
Work-Saver Pipe Tools

The Ridge Tool Company, Elyria, Ohio, U.S.A.

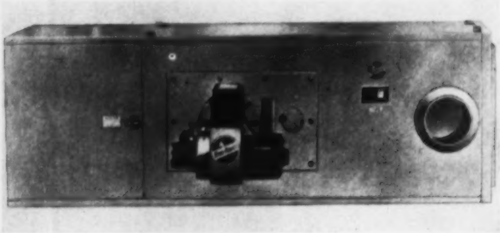
EQUIPMENT DEVELOPMENTS

Continued


PRE-COOLING AIR IN
REFRIG GAS IN
AIR OUT
DUOPASS PRE-COOLING COIL
CONDENSING AIR IN
RE-CIRCULATED WATER SPRAY
OIL OUT
CONDENSING COILS
REFRIG LIQUID OUT

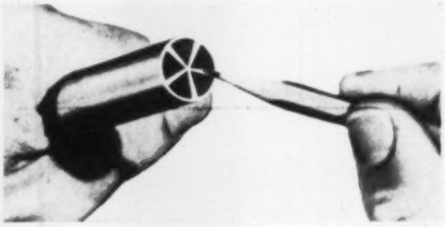
Evaporative Condenser . . .

. . .with capacities to 240 ton ammonia refrigeration—Niagara Blower Co., 405 Lexington Ave., New York 17. Refrigerant condensed in two parallel mounted coils enclosing central plenum under fan section. Water sprays arranged over coils. Air enters from above, travels downward and changes direction to enter plenum where entrained water is eliminated. Air then moves up and out through propeller fans. Only water consumed is that evaporated. Also in sizes 90, 120, 180 tons.



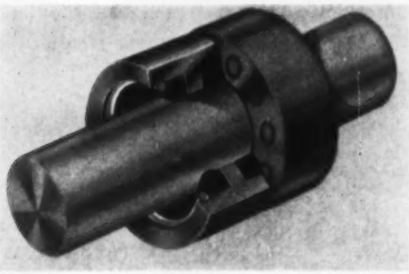
Direct Oil Fired Heater . . .

. . .for commercial installations such as plants, garages, filling stations, etc.—Thermo-Products, Inc., North Judson, Ind. In two models with 85,000 and 111,000 Btu bonnet outputs. "Tuck-Away" feature permits installation in small crawl spaces, says company. Octagon designed heat exchanger is said to assure freedom from expansion noises, combustion rumble.



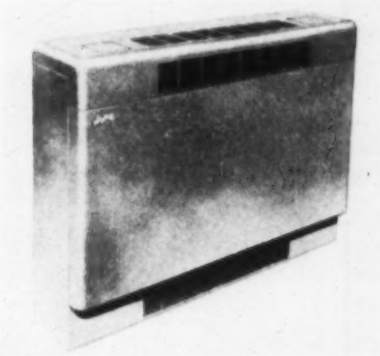
Liquid Chiller . . .

. . .with star shaped aluminum insert imbedded in walls of tubes—Acme Industries, Inc., Jackson, Mich. Accomplished by cold drawing process. Results in increased heat transfer surface over plain tubing. Provides clear passages for flow of refrigerant so that pressure drop is minimized, says company. In 97 standard sizes with capacities ranging 5 to 400 tons.

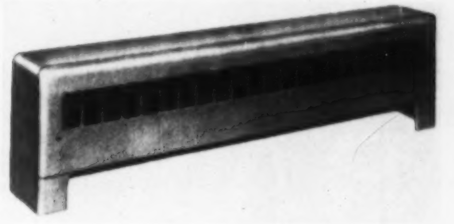


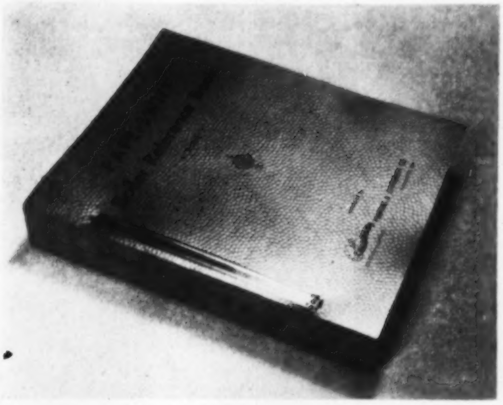
Shaft Seal . . .
. . .with magnetic inserts—Magnetic Seal Corp., 301 Sowams Rd., Barrington, R. I. Adaptable to both high, low pressures. Number of cylindrical inserts required to maintain face sealing pressure determined by size of seal. Is said to provide improved balanced pressure to eliminate warpage. Made to order by manufacturer.

Remote Room Conditioners . . .
. . .in 200, 400, 600 cfm models—Acme Industries, Inc., Jackson, Mich. Single units designed to provide heating, cooling, dehumidification, ventilation, filtering, circulation. Have individual room controls. Line includes models for ceiling, wall or free-standing installations.



Picture Window Convectors . . .
. . .designed to heat, block down drafts—C. A. Dunham Co., 400 W. Madison St., Chicago. Can be floor mounted, partially or completely recessed below pic-





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PAPE-SWIFT BOILER REFERENCE BOOK

It Contains:

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- Over 900 pages, 8½ x 11", bound in loose-leaf form Steam and hot water radiation up to 70,000 square feet.
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NEW

RAY

pressure burner eliminates secondary air

Tall stacks and induced draft fans can now be eliminated by using these new Ray automatic burners. No secondary air is needed. Modifications are available to fire against positive firebox pressure of up to ¾ inch w.c. with no loss of capacity.

In addition, the new Ray ignition system does away with another familiar headache — nozzle coking and plugging. This system provides a nozzle purge with each firing cycle during extended gas firing periods.

Completely wired and assembled at the factory, including controls and valves. Only fuel and power lines need be attached for operation.

Write your authorized Ray Dealer today for complete information on the new Ray Pressure Burners. Find out how this unit can increase the efficiency of your Burner operation.

RAY OIL BURNER CO.

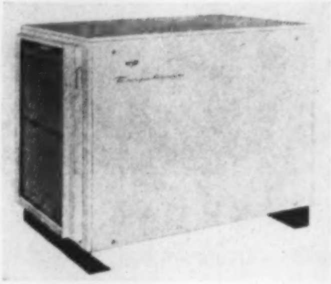
[illegible]

DISTRIBUTORS IN ALL PRINCIPAL CITIES OF THE WORLD

EQUIPMENT DEVELOPMENTS

Continued

ture windows. Have rounded corners for safety, appearance. In lengths to 112 in. Heating element consists of aluminum fins, copper tubes silver brazed into cast bronze header. Tubes expanded into fins to assure tight mechanical bond, fast heat transfer, says company.

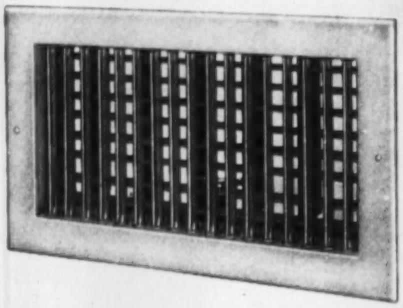


Air Conditioners . . .

. . . for remote installation—Frigidaire Div., General Motors Corp., Dayton 1. In 2, 3, 5 ton capacity sizes. For small business applications. Each model contains filters, multipath cooling coil, thermostatic valve, centrifugal blower, motor. Can be used with city water, tower water, evaporative or air cooled condensing units.

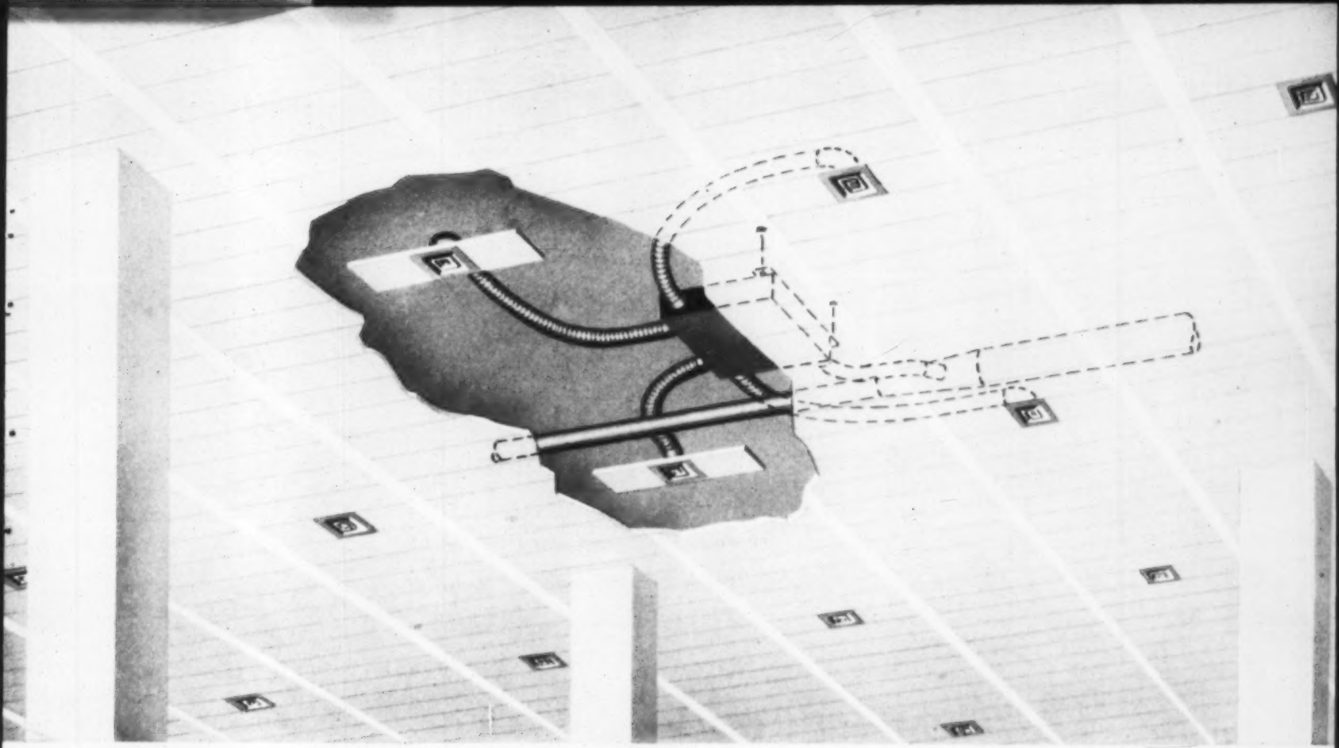
Commercial Type Registers, Grilles . . .

. . . with face bars built with air foil contours to reduce resistance, facilitate quiet at high velocities—Air Control Products, Inc., Coopersville, Mich. Bars individually adjustable. "Multi-Trol" line features "Shallo-Valve" opposed action louvers, so designed to reduce depth of valve to minimum, says company. Both registers (with valve), grilles (without valve) available in single or double deflection models with variety of bar arrangements.



Commercial Thermostat . . .

. . . for temperature control in installations where dirt, humidity present a problem—General Controls Co., Skokie, Ill. Featuring mercury switch, components including bimetal element, case and cover made of stainless steel. Heavy duty, light duty and millivolt models suitable for general purpose temperature control of heating, ventilation, refrigeration, processing equipment.

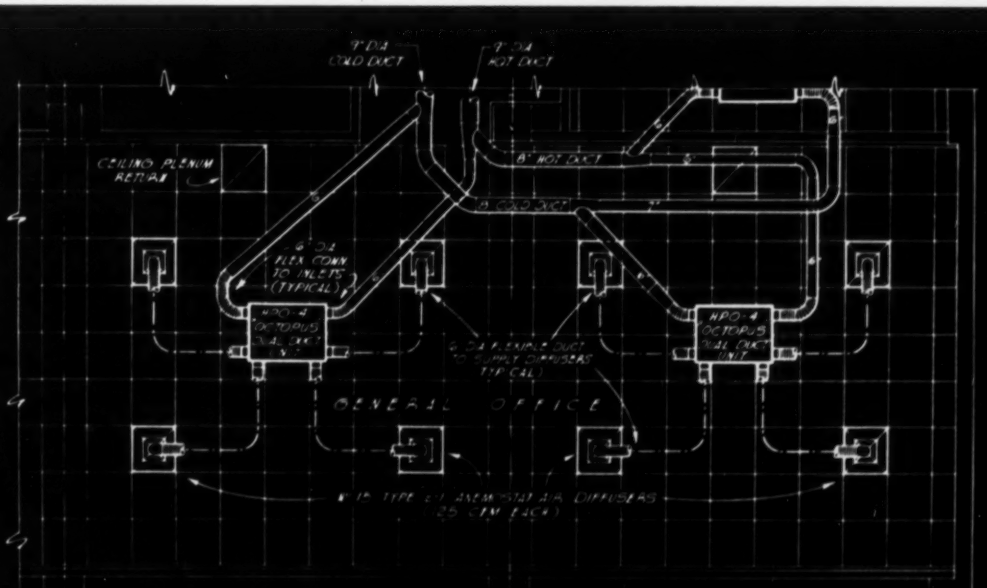


Here's *flexible* high velocity air diffusion

Here's how the new Anemostat Octopus unit works in interior zone air conditioning. High velocity air travels to a sound attenuator volume control unit, which has from *two* to *four* openings. The air is carried from these outlets through flexible hose to Anemostat diffusers. These have the same outer dimensions as the acoustical panels. If the space must be adjusted to meet changing conditions, such as subdivision of the occupied area, ceiling panels and diffusers can be quickly relocated by merely moving the flexible hose.

Air can be supplied to the Anemostat Octopus sound attenuators from a dual-duct system with a thermostat controlling one bay, or from a single-duct system with automatic or manual control.

Write on your business letterhead for Selection Manual 50 which gives full application and specification data on wide range line of Anemostat All-Air High Velocity units. Anemostat Corporation of America, 10 East 39th Street, New York 16, N. Y.


9" DIA COLD DUCT
9" DIA HOT DUCT
CEILING PLENUM RETURN
8" HOT DUCT
8" COLD DUCT
6" DIA FLEX CONN TO INLETS (TYPICAL)
HPO-4 OCTOPUS DUAL DUCT UNIT
HPO-4 OCTOPUS DUAL DUCT UNIT
6" DIA FLEXIBLE DUCT TO SUPPLY DIFFUSERS (TYPICAL)
GENERAL OFFICE
Nº 15 TYPE E-1 ANEMOSTAT AIR DIFFUSERS (125 CFM EACH)

Diagrammatic illustration of office building showing Anemostat HPO-4 Dual-duct Units.

"How we beat gas restrictions with Janitrol Unit Heaters"

AT Huttig SASH & DOOR CO.

"Our Janitrol equipment gives us efficient gas heat, regardless of location."

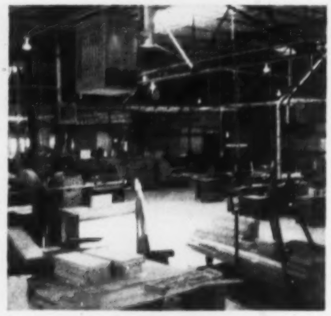
SAYS...

Mr. F. W. Stewart
Vice President-Treasurer

"Every post-war plant in Dallas, Charlotte, and St. Louis—is heated by gas-fired Janitrol unit heaters. They were recommended by our engineers. Our Janitrols have operated economically and efficiently," reports Mr. Stewart.

"Also, in areas with gas restrictions, we've found that Janitrol units operate with equal efficiency on our supply of stand-by LP-gas when natural gas is temporarily curtailed."

Change-over is made at a moment's notice by the operation of only two levers. This all-gas system saves considerably over other dual fuel types both in operation and original cost. Where natural gas is not available, straight L-P or "tank" gas is often very practicable.



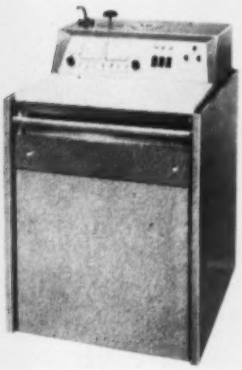
Photographs show Huttig's new St. Louis plant, one of several with office and production areas heated by gas-fired Janitrol Unit Heaters.

Janitrol
GAS-FIRED UNIT HEATERS

For more information on the use of unit heaters in many types of new or remodeled buildings, write for your copy of "Businessman's Blue Book of Better Heating".

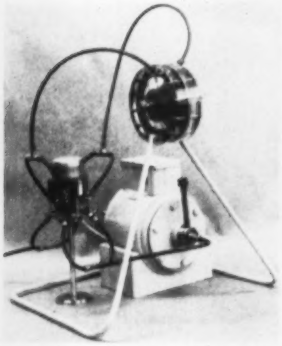
Janitrol Heating & Air Conditioning Division
Surface Combustion Corporation, Columbus 16, Ohio
In Canada: Alvar Simpson Ltd., Toronto 13

ALSO MAKERS OF Surface INDUSTRIAL FURNACES AND Kathabar HUMIDITY CONDITIONING



Leak Detector . . .

. . .for air conditioning, refrigeration equipment—Beckman Div., Beckman Instruments, Inc., Fullerton, Calif. Is mass spectrometer designed to identify gases by their molecular weight. Tuned to respond only to helium to provide fast instrument response. Audible, visible warnings pinpoint location of leaks.



Controlled Volume Pump . .

. . .for downhill pumping—Milton Roy Co., 1300 E. Mermaid Ln., Philadelphia 18. Designed to accurately meter liquids or gases against negative discharge pressures. Recommended by company for low capacity flow control problems involving metering from high suction to lower discharge pressure. In four sizes: 3, 15, 75, 375 ml per cycle.

Industrial Fans . . .

. . .with streamlined design for high efficiency—American Blower Corp., Detroit 32. Line is said to provide complete coverage of full range of industrial requirements. Features new

Dry Bulb °F	RH %
25	73
25	80
140	1.3
140	80
77	14.2
77	80

Kathabar humidity conditioning meets these design specifications in two rooms like the one at left, in laboratories of one of the world's largest chemical companies.

control humidity for testing and processing

Whatever atmospheric humidity you need for testing, Kathabar humidity conditioning has the range of control to meet your requirements. For example, a Kathabar system provides RH from 1.3% to 80% at 140°F in this testing room for chemicals and packaging materials. In another lab, the system delivers air at –82°F without frost, *continuously.*

The basis for this tremendous range is the extreme flexibility of the absorbent medium used in the Kathabar system. Dewpoint depression is independent of temperature. This flexibility has been put to work, with either automatic or manual controls, testing and processing basic chemicals, explosives, film, glue and gelatin, petrochemicals, pharmaceuticals, plastics, rubber, shellac, cereals, coffee, and yeast.

In addition to its flexibility and ease of control, Kathabar humidity conditioning is more economical than overcooling and reheating to produce desired RH. Find out how this system can work for you, *in pilot plant or production line.*

Kathabar®
HUMIDITY CONDITIONING

SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO

Have humidity conditioning engineer call. ( )
I'd like to know more about Kathabar systems for:
Stopping moisture regain ( )
Eliminating condensation ( )
Drying at low temperatures ( )
Testing products ( )
Operating below 32°F. ( )
Comfort-conditioning space ( )
Desired air conditions: CFM ______; Temperature ______°F; RH ______%.

NAME ______ TITLE ______
COMPANY ______ PRODUCT ______
ADDRESS ______

Get free help on your humidity control problems

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515 Yazoo St., Jackson 2, Miss.
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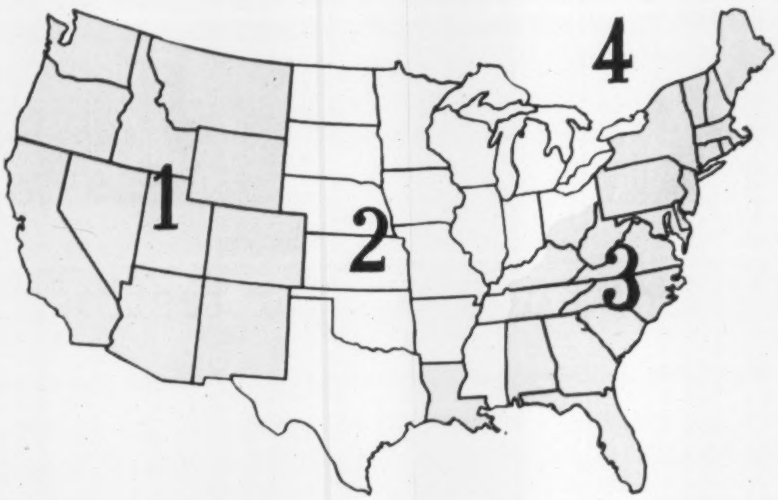

Wiremold Air Duct Representatives are qualified air conditioning engineers

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Flexible
AIR DUCT

- ■ Light but sturdy
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Air Duct — service-proved in many large buildings. Recommended by makers of air distribution equipment. Specified by leading architects and engineers.

- ✓ **Developed to meet all requirements for flexible connections in commercial air-conditioning systems.**
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Oliver Bldg., Pittsburgh 22, Pa.

OHIO (northeastern)
The Thermal Products Co.
1609 St. Clair Ave., Cleveland 14, Ohio

227 West Exchange St., Akron 2, Ohio

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General Equipment, Ltd.
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Vancouver 10, B. C., Canada

FOREIGN

CUBA
Controles Honeywell, S. A.
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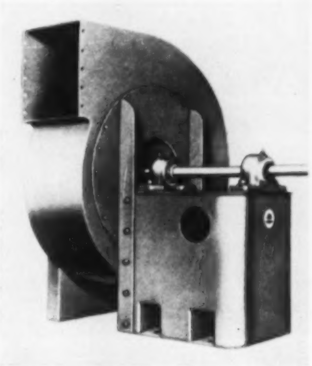
Havana, Cuba

EQUIPMENT DEVELOPMENTS

Continued



packaged fan complete with motor, v belt drive, running gear enclosure. Series available in sizes 11 to 37 with adjustable discharge in v belt driven arrangements 1 and 9 for full range, direct connected arrangements 4 and 8 for limited sizes.

Equipment Briefs . . .

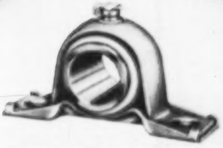
STAINLESS BRAZING ALLOY available in paste form—Stainless Processing Div., Wall Colmonoy Corp., 19345 John R St., Detroit 3. Recommended by company for use in brazing applications involving stainless steels, nickel base, cobalt base, similar alloys—also low alloy steels, carbon steels, copper.

SLING PSYCHROMETER designed for easy use—Taylor Instrument Companies, 95 Ames St., Rochester 1, N.Y. Cited features: gold back for greater contrast, easier reading; protective back finished in gray baked synthetic enamel, also for increased contrast; redesigned handle that folds out of the way when not in use.

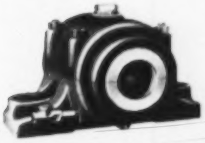
WINCH-HOIST with lightweight design, 2 ton capacity—Lug-All Co., 355 Lancaster Ave., Haverford, Pa. Weighing 15 lb, lifts, lowers or pulls 2 tons distance of 10 ft using double cable, or handles 1 ton 20 ft using single cable.

DEHUMIDIFIER with radical design, new control principle—Dryomatic Corp., Alexandria, Va. Is said

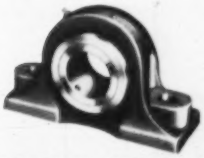
DODGE PRODUCTS
You Should Know-



BRONZOIL BEARINGS



SLEEVOIL BEARINGS



SC & SCM BEARINGS

Dodge Bulletins you should have-

☒ Bronzoil Self Oiling Bearings. Dimensions and selection data.

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☒ Rolling Bearings. Load ratings, dimensions and other data on SC and SCM Ball Bearings and Dodge-Timken Roller Bearings. Bulletin A-638.

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EQUIPMENT DEVELOPMENTS

Continued

to maintain humidities as low as 10 percent in areas to 60,000 cu ft over wide temperature range.

RELAY rated up to 8 amperes, at 115 volts, 60 cycles, noninductive load—Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago 12. Is said to incorporate considerable power capacity, multiple contact combinations in small space. Combinations available to three-pole, double throw.

BOTTOM BEARING EXPANSION SHIELDS for use with hanger rods, similar suspensions where no fixture is placed against end of rod to provide abutment for expanding it. Star Expansion Bolt Co., Inc., 112 Liberty St., New York 6. For piping, sprinkler systems, ductwork, conveyor systems, similar installations.

WELDING CABLE REEL designed to handle up to 100 ft of 2/0 cable at 300 amperes—United Specialty Corp., P.O. Box 698, El Dorado, Ark. Heavy duty spring and gear mechanism retracts cable when not in use. Cable may be locked at any desired length by means of locking pawl arrangement.

COUPLING for use in suspension of unit heaters, air conditioners, heating and air conditioning ducts, pipes, etc.—Winchester Western Div., Olin Mathieson Chemical Corp., 460 Park Ave., New York 22. "Drive-Thru" used in place of conventional threaded stud and coupling. Can be used with $\frac{1}{4}$ in. drive pin only.

SHEAVES for fractional horsepower, light duty industrial drives—Allis-Chalmers Mfg. Co., Milwaukee 1. Line includes single groove sheaves in both bushed and bored-to-size construction with "A" section or combination "A-B" grooving.

NYLON-JACKETED CABLE with polyvinyl chloride insulation—Sunwarm, Inc., Kingsport, Tenn. For

from craftsmanship to comfort
A PHILADELPHIA "HI-SPEED" DOUBLE HELICAL GEAR SPEED INCREASER

We are proud of the fact that two of the latest Philadelphia "Hi-Speed" Increaser Units were chosen to drive the air conditioning compressors in one of Philadelphia's modern new *Office Buildings.* These Units are 800 BHP each; 1770 rpm in-put speed; increase ratio 3.305; out-put speed 5,850 rpm.

These completely standardized "Hi-Speed" Increaser and Reducer Units are the result of over 62 years' experience in gear design, development and manufacture and readily meet the growing demand for higher speed prime movers such as Steam Turbines, Ultra-high Speed Electric Motors and Internal Combustion Engines.

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Industrial Gears & Speed Reducers
LimiTorque Valve Controls
Established 1892

In concrete or steel...you can set fastening studs *in seconds* with the REMINGTON STUD DRIVER

THERE'S NO TIME LOST on a construction fastening job with the Remington Stud Driver. You can set up to 6 studs per minute with this powder actuated tool—every stud arrow-straight!

And here's more news: you can set *both ¼" and ⅜" diameter studs.* You have a choice of 40 styles and lengths of Remington Studs in both diameters—a choice of 22 or 32 caliber power loads. All it takes is 90 seconds to change barrels and you're ready for practically *every* fastening job—light, medium or heavy duty!

Once you see the Remington Stud Driver in action you'll be convinced that here is the easy, economical way to fasten door bucks, furring strip—any of dozens of fixtures—to steel or concrete. Why not ask your distributor for a demonstration? For more information, just mail the coupon below.

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REMINGTON STUD DRIVER
FASTENING METHOD

Industrial Sales Division, Dept. HPAC-1
Remington Arms Co., Inc., Bridgeport 2, Conn.

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EQUIPMENT DEVELOPMENTS

Continued

plaster, dry wall construction. Jacketing is said to increase toughness of cable.

SOLDERING PASTE for copper tubing—Mill-Rose Co., 1985 E. 59th St., Cleveland 3. Is said to be non-corrosive. Available in 2 oz or 1 lb cans.

MEASURING DEVICE designed to accurately measure v-belt vibrations—Dayton Rubber Co., Dayton, Ohio. Tabulates vibrations down to .0001 in. amplitude. Recommended by company for use in engineering for quietness in air cooling equipment.

¼ IN. POWER DRILL with design features for industrial use—Power Tool Div., Dormeyer Corp., Kingsbury and Huron Sts., Chicago 10. Has "Wrench-Lok" chuck for easier bit changes, multiple ball thrus bearing and self lubricating bearings, hardened steel gears, die cast aluminum alloy housing for added strength, says company.

WATER HEATER THERMOSTAT designed for accurate temperature control—Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30. Is said to have long service life. Can maintain water temperature to within 3 deg of original calibration after 50,000 cycles, says company. ‡

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The Halstead & Mitchell Cooling Towers you select are *matched* by design to work with the famous Halstead & Mitchell water-cooled Condensers. You need no longer buy a high-efficiency cooling tower to work with a low-efficiency condenser (or *vice-versa*) . . . a long-life cooling tower to work with a short-life condenser (or *vice-versa*).

Remember that every cooling tower you sell is planned to work with a water-cooled condenser—then you'll see why America's leading manufacturers of air-conditioning and refrigeration equipment have swung to Halstead & Mitchell for their original equipment needs in both these components. With cleanability you'll sell more. Why sell less?

20-Year Guarantee!

on the wetted deck surface against rotting or fungus attack

Only Halstead & Mitchell pressure-creosoting can provide a *guarantee* against immediate attack by fungus and marine parasites . . . or chemical deterioration from acids in water.

Added to this H&M exclusive are other major advantages. There's ultra-high efficiency in the gravity-type water distributing pan which eliminates extra pumping head required on spray type towers . . . and cuts down on water losses due to "atomizing" of water. And there's extra-long life in stainless steel fans . . . and sheet steel cabinets hydraulically painted with vinsynite, vinyl zinc and chlorinated rubber.

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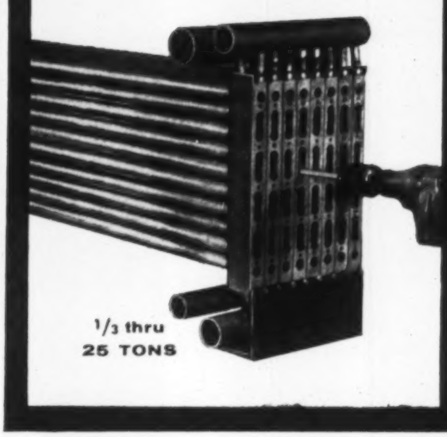

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Lifetime Cleanability

The *mechanical* cleaning of H&M double-tube, counter-flow condensers means the simplest, least dangerous method of restoring new unit efficiency. Whether removing a heavy coating of sludge and scale, or a thin insulating film on the inner walls of the copper tubing, the mechanical cleaning tool restores heat transfer efficiency in a matter of minutes. The result is lowered discharge pressures . . . more heat carried off by cooling water . . . lower bills. *Only* the impurities are removed . . . the thickness of the copper wall remains intact, and the condenser gives extra years of peak service.

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EVERYWHERE

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Tata Iron and Steel Company's new engineering office building at Jamshedpur, India. Tata is the foremost steel company in India. Vilter air conditioning serves the entire building.

Vilter air conditioning installation in this office building. Shown are the two Vilter refrigeration units.

Q - How do they beat the 110°F. heat in Jamshedpur, India?

A. with Vilter AIR CONDITIONING EQUIPMENT that costs less to own*

In Jamshedpur, India, summer temperatures that often soar to a bake-oven 110° F. are no problem to the engineering staff of India's largest steel mill, The Tata Iron and Steel Company. The company's new engineering office building has Vilter air conditioning that keeps the interior at just the right temperature and humidity.

Two Vilter condensing units are used. Each unit consists of one six-cylinder VMC compressor, oil separator, 60 horsepower motor and a two-pass condenser. Each unit is fully automatic and designed to deliver 60 tons of refrigeration. The smooth uninterrupted performance of this equipment has won the full approval of the Tata officials.

Tough climatic conditions such as those at Jamshedpur require careful engineering to provide the desired temperature and humidity conditions without causing a shock when entering or leaving the building. Combine long years of successful design experience with the industry's soundest line of equipment and you know why Vilter can custom build an air conditioning system to serve your special needs. Call on your Vilter representative or distributor today.

Sold and Installed by Universal Refrigeration Corp. Ltd.
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* Savings in low first cost are not the complete answer when considering the installation of refrigeration equipment. But savings in terms of years of extra service, reliable performance and minimum maintenance—that's where Vilter excels in low-cost ownership.

QUALITY CRAFTSMANSHIP that lasts . . .

ENGINEERING DESIGN that guarantees performance

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THE VILTER MANUFACTURING COMPANY, Milwaukee 7, Wisconsin

Air Units • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Water & Brine Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pipe Coils • Valves & Fittings • Pakice & Polarflake Ice Machines

RECENT TRADE LITERATURE . . .

▸ *AIR CLEANING*—Case history of air cleaning at a hospital presented in 4 page folder. Literature calls attention to benefits provided by electronically cleaned air. Trion, Inc., 1000 Island Ave., McKees Rocks, Pa.

▸ *AIR CONDITIONING, REFRIGERATION CONTROLS*—Catalog describes company's complete line of air conditioning and refrigeration controls. Many new controls, late improvements and changes in line cataloged for first time. General Controls Co., Glendale, Calif.

▸ *AIR COOLED CONDENSERS*—New remote air cooled condensers described in bulletin AC-100. Lists features. Includes table of performance data. Gives dimensions, weights. Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22.

▸ *AIR RECOVERY PANELS*—Bulletin 106-D covers "Dorex Type G" activated carbon air recovery panels for removal of odors and vaporous impurities for recirculated air. Performance, selection charts included. Connor Engineering Corp., Danbury, Conn.

▸ *ALUMINUM PRODUCTS*—Range of wrought aluminum mill products presented in new 8 page brochure. Illustrations, text describe extruded shapes, structurals, machining stock, drawn tube, forging stock, press forgings, impact extrusions, etc. Includes data, specifications. Harvey Aluminum, 19200 S. Western Ave., Torrance, Calif.

▸ *BALANCING*—New catalog on use of "Dy-Namic" balancing in industry contains 24 pages of information on technological advancements which are said to improve machine maintenance work, production techniques. Includes tables, diagrams, application photographs. Bear Mfg. Co., Rock Island, Ill.

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NAME

ON EVERY

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DURIRON is the *one* quality high silicon iron pipe specified for more than 30 years by architects and engineers for corrosive waste disposal systems. Specify DURIRON. Insist on DURIRON for resistance to practically all commercial acids and other corrosive solutions. It generally outlasts the building. A complete line of DURIRON pipe and fittings is stocked by leading wholesalers throughout the country. Free Bulletin PF/4.

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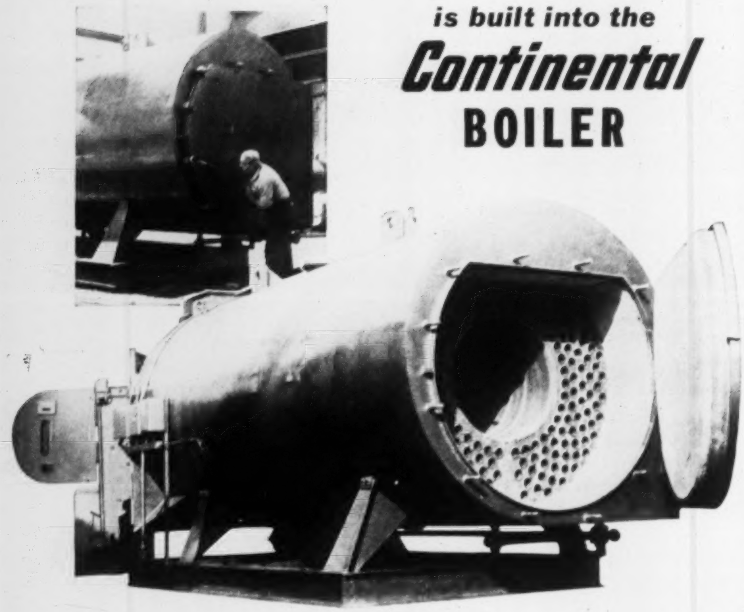
is built into the
Continental
BOILER



... saves production time
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Rugged, simple in design, accessible—that's the Continental Automatic Boiler. Here are a few reasons why it's easy to keep this packaged steam generator at peak efficiency:

- Openings are provided to facilitate inspection of steam and water space.
- Both front and rear doors are hinged—affording quick access to furnace and return tubes.
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AND HERE'S WHY CONTINENTAL BOILERS STAY EFFICIENT FOR A LONG TIME:

- 2-pass design eliminates refractory baffles in front and rear which may burn out, leak and cause short circuit of gases.
- *All* return tubes are subjected to the same temperature and do equal work . . . and there is more uniform longitudinal expansion of the pressure vessel.

Used for high or low pressure steam and for hot water applications, Continental Boilers are fully automatic, range from 20 to 500 hp. and can be gas, oil or combination fired. Over 80% efficiency is guaranteed.

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BOILER ENGINEERING
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Phoenixville, Pa.
Phone 5832

RECENT TRADE LITERATURE

Continued

▶ *BLOWERS*—Company's 1956 line of air conditioning blowers shown in new 18 page catalog. Standard belt driven models listed. Also includes "Rex" direct drive blowers. Air Controls, Inc., 2310 Superior Ave., Cleveland 14.

▶ *BRAZING ALLOY PASTE*—Data sheet No. 12 describes "Nicrobraz" stainless brazing alloy in paste form. Covers composition, properties. Outlines recommended applications. Wall Colmonoy Corp., Stainless Processing Div., 19345 John R St., Detroit 3.

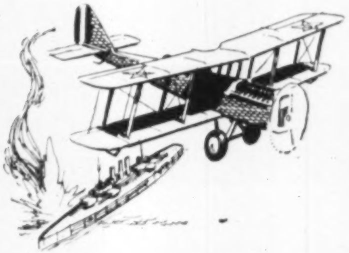
▶ *CLAY CONDUIT*—Folder presents history of underground heat transmission conduit systems. Illustrates various of company's types and lists features, specifications for each. Heat Transmission Conduit Co., 2300 Payne Ave., Cleveland 14.

▶ *CONTROL TRANSFORMERS*—New 32 page catalog GED-2767 describes company's line of control transformers. Contains ratings, dimensions, product features, model numbers. Special section shows voltage regulation curves for use in selecting proper transformer for given application. General Electric Co., Schenectady 5, N.Y.

▶ *DRAFTLESS AIR CONDITIONING*—Containing information necessary for specification writing for draftless air conditioning, catalog divided into 5 main parts: construction, installation details; performance data; sound level charts; description of "Modular" and "Unitary" air diffusers; ordering information. Multi-Vent Div., Pyle-National Co., 1334 N. Kostner Ave., Chicago 51.

▶ *EXPANSION JOINTS*—Data sheet Wd describes company's line of expansion joints designed to accommodate expansion in long pipelines of pneumatic materials handling systems. Perspective and cutaway drawings, together with information on application, construction and instal-

Mr. Daniels was willing to be bombed



ADMIRALS smiled when, in 1921, he claimed air power could sink battleships. Josephus Daniels, the Navy secretary, said he was "prepared to stand bareheaded on the deck of a battleship and let General Mitchell take a crack at me with bombing airplane."

But in an actual test, the most heavily armored dreadnaught ever built sank in minutes under the sledge-hammer blows of the world's first 1-ton bombs—bombs built to Billy Mitchell's order.

Mitchell was used to disbelief. In World War I, Pershing called his idea for dropping infantry by parachute absurd. "Experts" laughed when he talked of putting cannon in planes, scoffed when he predicted air speeds way in excess of 200 miles.

In his early fight for a strong air force, Mitchell saw very dark days. Yet he never lost faith in the American people, nor they in him. For they recognized his clear foresight and great fighting heart as part of the real American spirit.

It is this courageous spirit that makes America strong—so strong, in fact, that our country's Savings Bonds are regarded as one of the finest, safest investments in all the world.

Why not take advantage of that strength? Use United States Savings Bonds to guard your future, and your country's future. Invest in them regularly—and hold onto them.

It's actually easy to save money—when you buy United States Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done *for* you. And the Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, for as long as 19 years and 8 months if you wish! Sign up today! Or, if you're self-employed, invest in Bonds regularly where you bank.

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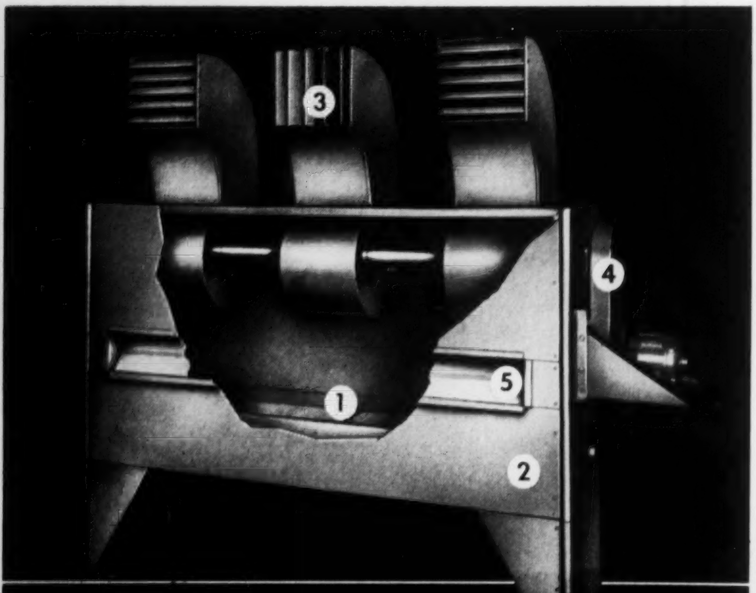

① Proven, Westinghouse-manufactured, extended surface heating coils good for continuous operation up to 200 psig.

② Die-formed casings with rounded corners eliminate accidents and dirt catching pockets. Front and back panels easily removable.

③ Multiple louvered outlets for efficient distribution of heated air.

④ Self-aligning, grease-lubricated ball bearings mounted outside casing readily serviceable.

⑤ Face and by-pass dampers permit continuous air circulation to maintain uniform temperatures.

NOTE: Louver-type mixing box accessory permits introduction of fresh air for make-up and ventilation, with or without filters.

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★ These rugged units available in 24 sizes, 8 coil selections, 150 ratings—from 100,000 to 2,500,000 BTU/hr., capacities from 2000 to 25,000 CFM each.

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J-80451

RECENT TRADE LITERATURE

Continued

lation also included. Allen-Sherman-Hoff Co., 259 E. Lancaster Ave., Wynnewood, Pa.

▶ *FASTENING SYSTEM*—New 8 page catalog details "Ramset" powder actuated system for fastening construction materials to steel or concrete. Shows fasteners in actual size. Groups fasteners with tool for which they are intended and divides them into sections by surface. Contains photographs and outline drawing of guards. Ramset Div., Olin Mathieson Chemical Corp., 12117 Berea Rd., Cleveland 11.

▶ *FLOAT TRAPS*—Float operated traps made in two series, semi-steel for steam pressures to 250 psi and cold pressures to 300 psi and fabricated steel for steam pressures to 600 psi and cold pressures to 1000 psi, detailed in new 4 page bulletin. Clark Mfg. Co., 1830 E. 38th St., Cleveland 14.

▶ *FLOWMETERS*—Flowmeters described in new bulletin feature direct flow design which utilizes a flexible vane traveling under flow to indicate flow on a calibrated scale. Design is said to eliminate delicate component parts. Instrument Div., Scully-Jones and Co., 1901 S. Rockwell St., Chicago 8.

▶ *GAGE TOLERANCES*—Bulletin contains data chart giving gage tolerances for round welded mechanical tubing, both cold rolled and hot rolled carbon steel. Nikoh Tube Co., 5000 S. Whipple St., Chicago 32.

▶ *HARDNESS CONVERSION*—Chart shows approximate relation between hardness by various testing systems and tensile strength of carbon and alloy steels. Systems covered are Brinell, Monotron, Vickers, Rockwell (B, C, E scales). Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.

▶ *HEAT EXCHANGER, CONDENSER TUBES*—New 8 page technical folder TB-329B discusses company's

We have a house to put in order...

WE HAVE A HOUSE to put in order . . . and it's the house where America lives.

Of our country's many million homes, more than 1 out of every 10 are out-and-out slums. Nearly one-half of all American dwellings are in poor to "fair" condition, and urgently need basic repairs.

Something *must* be done—both to correct the slums of today and *prevent* the slums of tomorrow.

How do slums start? Usually just one house starts to slide downhill and soon a whole block changes. Pride is lost. Other houses are neglected, decay spreads.

So the 20 million homes in need of basic repair and improvements deserve equal attention. The time to stop the spreading blight of slums is *before it starts*.

What's your stake in stopping slums?

If you think your town is different, just look around you . . . If you think slums only affect persons who live in them, think again.

Slums raise taxes and lower property values of the whole town. They raise rates of crime, delinquency and disease. *Everyone* has a real stake in stopping slums. And *that includes you as a businessman.*

Your firm is certainly dependent on the welfare of the community where you do business. But it's more than good business—it's good citizenship to take part in efforts aimed at civic improvements. It's the *responsibility* of every business.

What can your firm do? The answer to America's housing problems starts with individuals. But to roll back slums is such a big job it's going to take more than individual effort. It will need the cooperation of your business and many others.

Some slums should be torn down and a fresh start made. Others can be remodeled and made to conform to better living standards. So it is up to you to support every sound program which seeks adequate housing for all our people.

New help is now available

There is a new national, non-profit organization called A.C.T.I.O.N.—The American Council To Improve Our Neighborhoods—which is designed to help all individuals or groups interested in putting America's house in order.

Send for a free copy of "ACTION." It explains what A.C.T.I.O.N. is and proposes to do. It lists booklets, research, check-lists, and other material which can help you. Address P. O. Box 500, Radio City Station, New York 20, N. Y.

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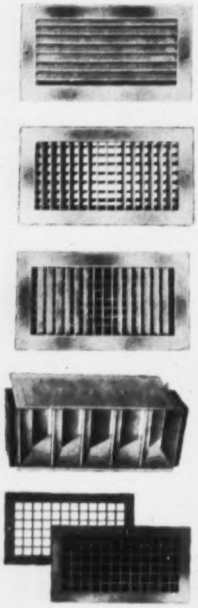
the complete **Quality** line of



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RECENT TRADE LITERATURE

Continued

heat exchanger and condenser tubes. Covers information on popular grades of carbon, alloy and stainless steel tubing, both seamless and welded. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.

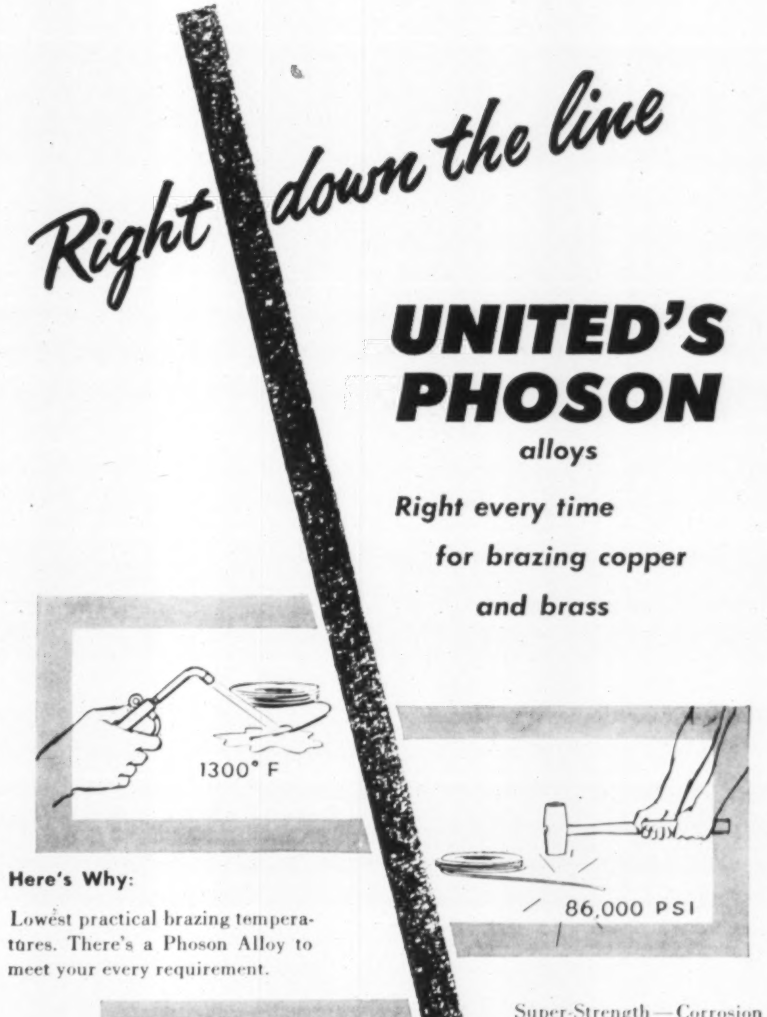
▶ *HEAT EXCHANGERS*—Bulletin No. 31 provides dimensions, data, capacities of shell and tube heat exchangers for selection of the more commonly used types of water heaters, converters, condensate coolers. Buxton Mfg. Co., Dover, N.J.

▶ *HEAT FLOW BY RADIATION*—New 48 page manual describes company's complete line of insulations, their specialized uses. Offers installation techniques. Includes simple, scientific discussion of laws of physics, significant illustrated experiments. Infra Insulation, Inc., 525 Broadway, New York 12.

▶ *IMPELLER PUMPS*—Report on findings with respect to physical, chemical characteristics of nonmetallic impellers for displacement pumps presented in 4 page folder. Synthetic elastomers, fluorocarbons, resinous laminates surveyed and influences on them of chemicals, mechanical and thermal stresses reviewed. Eco Engineering Co., 12 New York Ave., Newark.

▶ *INDUSTRIAL RADIOGRAPHY*—Bulletin P-196 describes "Kel-Ray" projectors for industrial radiography with gamma rays. Explains how portability, safety, versatility, economy of equipment expands range of applications radiography may be used. Metal & Thermit Corp., 100 E. 42nd St., New York 17.

▶ *INSTRUMENTS*—Form V-140 gives information on "Temprobe" portable electric thermometer, thermistors and varistors, and combustion analyzer. Victory Engineering Corp., Springfield Rd., Union, N.J.



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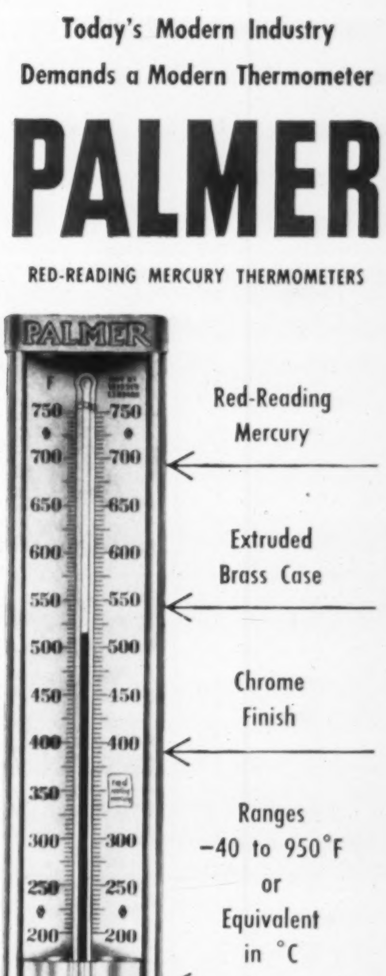

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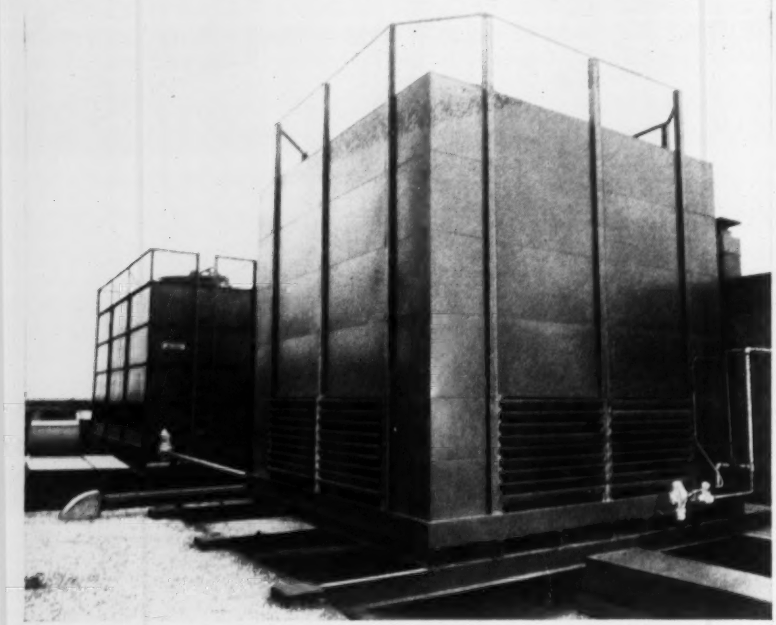

Here's why Chicago's Hotel LaSalle chose a Binks tower—19 years later!

Last summer Chicago's Hotel LaSalle air conditioned its public rooms. To cool the large compressors the hotel purchased a 350-ton capacity Binks cooling tower…and for good reason:

Nineteen years ago—in 1937—the hotel erected a 200-ton Binks tower on the roof, 22 stories above the street, exposed to the Windy City's constantly changing weather. As can be seen in the above picture, that tower (left) is still in excellent condition. It gives the same high efficiency cooling that it did when it was new. Its maintenance has been economical in both time and dollars—despite its exposure to the elements for 19 years. With such time-tested proof of dependability, it is no wonder that the Hotel LaSalle chose Binks to supply its new tower.

Standardized models assure economy

Binks complete line of forced and natural draft cooling towers is built from standardized panels and parts. They are available in capacities from 3 to 1000 tons. These towers are engineered to provide the correct air-to-water ratios for proper cooling under your local conditions. They are ruggedly constructed of heavy gauge steel, protected from moisture and the elements by galvanizing and complete shop painting.

In Binks' wide range of Cooling Tower models there is one for nearly every size and type of installation…a tower that precisely fills your specifications without costly design or custom construction.

ENGINEERING HELP AVAILABLE

To help you select the right type and capacity tower a Binks Engineer will gladly study your needs and submit proposals without obligation. For full details, write to the address below:

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Binks
EVERYTHING FOR WATER COOLING

A COMPLETE LINE OF NATURAL DRAFT AND MECHANICAL DRAFT COOLING TOWERS AND INDUSTRIAL SPRAY NOZZLES

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RECENT TRADE LITERATURE

Continued

▶ *MAGNETIC DRIVE*—New bulletin 4400-PRD-229 illustrates "Ampli-Speed" magnetic drive designed to provide precise, adjustable speed power for wide application range. Folder explains use of drive for fan type (centrifugal fans, pumps, compressors) and constant torque loads (conveyors, mixers, machine tools, etc.). Electric Machinery Mfg. Co., Minneapolis 13.

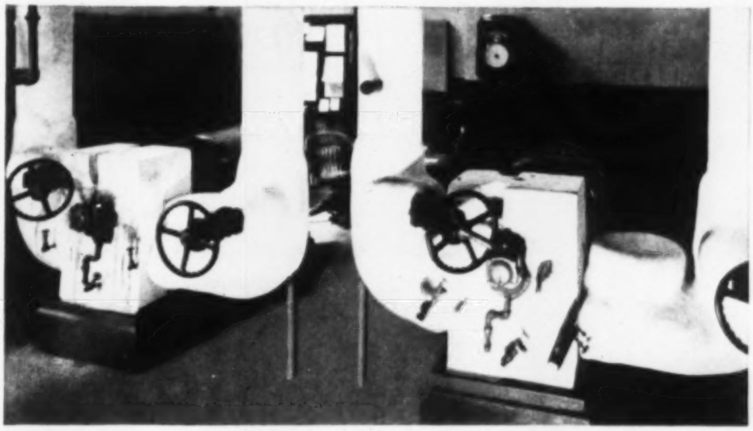
▶ *MECHANICAL TUBING* Bulletin TB-361 designed to acquaint engineer with advantages to be gained by using mechanical tubing. Lists technical literature available. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.

▶ *MOTORS* Bulletin N-100-R discusses in 16 pages company's series 100 motor designed to be smaller, lighter, cooler running. Includes cutaway illustrations, diagrams. Covers both totally enclosed fan cooled and open dripproof types of integral horsepower unit. Details other enclosures, mounting variations. Howell Electric Motors Co., Howell, Mich.

▶ *MOTORS, GENERATORS*—Motors, ranging 1/20 to 2500 hp, generators, ranging ½ kw to 2000 kw, illustrated in new booklet. Publication covers company's engineering, testing methods applied in their construction. Marathon Electric Corp., Wausau, Wis.

▶ *OIL LEAK DETECTION*—New 8 page bulletin No. 80 illustrates "Paraprobe" oil leak detection system for steam type fuel oil heaters. Details operation of system. Includes installation diagrams, standard specifications, method of determining rate of flow of condensate. Davis Engineering Corp., 1064 E. Grand St., Elizabeth 4, N.J.

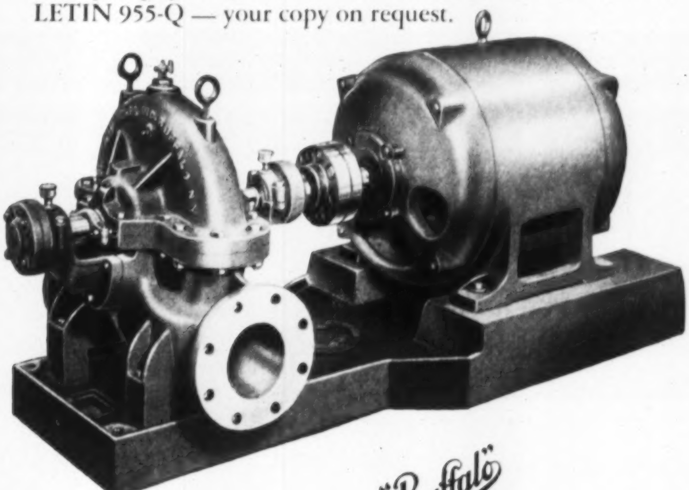
▶ *PACKAGED BOILERS* Bulletin A-1011 contains complete information on "Red Band" line of Scotch type "Steamboilerplants." Pictures



UNDER THE INSULATION

— You Want a Pump You Can Trust

Pumps are by no means the most expensive equipment in a refrigeration or air conditioning system like the above — yet the system can function no better than the pumps. Here, certainly, is no place to cut corners. "Buffalo" Type SL Double Suction Pumps have a built-in efficiency and reliability that makes them the SAFE choice for clear water installations. We call this construction the "Q" Factor*. It's been a part of "Buffalo" Pumps for 78 years — and in countless liquid moving jobs, "Buffalo" has proven to be "the pump you can trust." FULL DETAILS IN BULLETIN 955-Q — your copy on request.



"Buffalo"

TYPE SL DOUBLE SUCTION PUMP

*The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.

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DIVISION OF BUFFALO FORGE COMPANY
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A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

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The Engineering Service Division of du Pont's Engineering Department now has immediately available a challenging long-range position for a graduate engineer with 5 or more years experience in the selection and operation of heating, air conditioning, ventilating, and refrigeration equipment. The successful applicant will provide consultation to operating plants and to design and construction groups on the evaluation and economic operation of such equipment.

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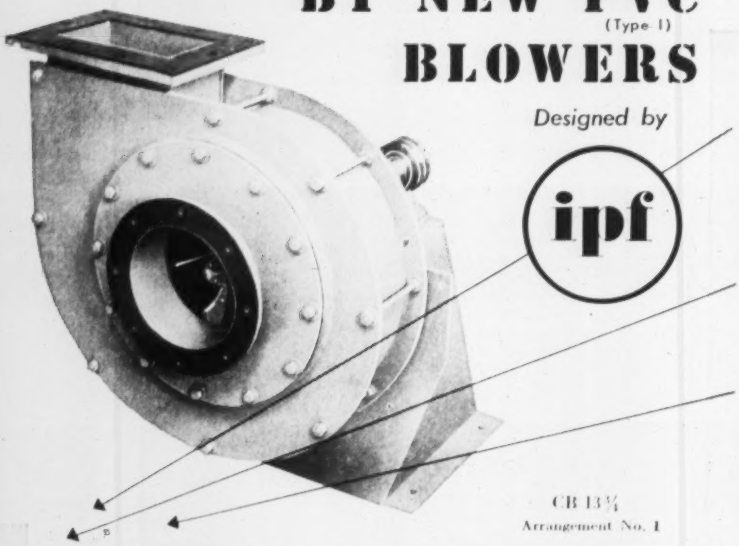

CB 13¾
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If your problem is expelling corrosive fumes and gases, you need IPF Blowers. Ordinary blowers are susceptible to attack by these fumes and gases. Coating the blower is costly — and not foolproof. Maintenance and replacement costs are high . . . and valuable time is lost. Result — an expelling operation that eats into profits.

For trouble-free, long-life blowers, specify **IPF** blowers made of Unplasticized, Rigid Polyvinyl Chloride (UPPVC). UPPVC — the new construction material — exhibits inherent anti-corrosive qualities that allows **IPF** Blowers to withstand most chemical fumes and gases from 40°F to 140°F. Actual installations of **IPF** Blowers have lasted three times the normal life of ordinary blowers . . . and continue to function efficiently.

UPPVC is a lightweight . . . smooth-surfaced . . . nonporous material of construction. Lightweight construction means greater capacity per B.H.P. . . . easier installation . . . reduced handling problems. Smooth, nonporous finish never require painting or maintenance expense. **IPF** Blowers are not subject to unbalance from chipping of a protective coating . . . because there is no coating. It's solid UPPVC.

IPF Blowers made of UPPVC are available in standard sizes that provide displacements from 143 C.F.M. to 7722 C.F.M. Standard wheel sizes of 9½, 13¾, 19, and 27 inches. Other sizes and capacities can be custom designed to fit special requirements. Full details on the new **IPF** Blowers available upon request.

Full details on the new IPF Blowers available on request.

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RECENT TRADE LITERATURE

Continued

complete 12 to 125 hp size range. Discusses operating characteristics. Eclipse Fuel Engineering Co., Rockford, Ill.

▶ *PIPE FITTINGS, FLANGES*—Unplasticized polyvinyl chloride fittings, flanges covered in new booklet. Industrial applications discussed. Specifications for threaded and socket types in normal, high impact grades given. Tube Turns Plastics, Inc., 2929 Magazine St., Louisville 1.

▶ *PLASTIC PIPE*—New folders from manufacturer tell applications, properties, fittings for polyvinyl chloride corrosion-resistant pipe. First folder shows reference information for selection of pipe. Companion folder describes, illustrates threaded and socket solvent cement fittings. Alpha Plastics, Inc., 15 Northfield Rd., West Orange, N.J.

▶ *PLATE COIL*—Bulletin No. 265 gives data and price information on "Thermo-Panel" plate coils for industrial cooling and heating processes. Thermo-Panel Div., Dean Products, Inc., 616 Franklin Ave., Brooklyn 38.

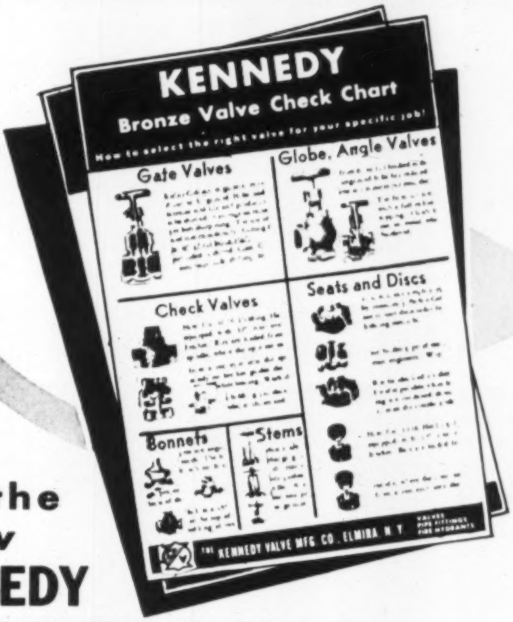
▶ *PLATING WASTE TREATMENT*—Technical article T-136 discusses two methods of treating plating wastes by ion change or precipitation. Details costs involved, space requirements. Graver Water Conditioning Co., 216 W. 14th St., New York 11.

▶ *POTENTIOMETER*—New potentiometer, designed for high speed, described in bulletin P1270. Is said to have full scale pen travel across 11 in. calibrated chart in 0.4 sec. without overshot. Bristol Co., Waterbury 20, Conn.

▶ *POWER TOOL*—New 36 page manual describes "Routo-Jig," designed to combine functions of jig saw, router, shaper, jointer in single portable electric tool. Porter-Cable Machine Co., 65 Exchange St., Syracuse 8.

KENNEDY

gives you the answers to your Valve questions . . .



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Bronze Valve Check Chart

How to select the right valve for your specific job!

Gate Valves

Globe, Angle Valves

Check Valves

Seats and Discs

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Stems

THE KENNEDY VALVE MFG. CO. ELMIRA, N.Y.

VALVES PIPE FITTINGS FIRE HYDRANTS

with the *New* KENNEDY VALVE Check Charts . . .

show you at a glance *How, When, Where* to use the correct valve to fit the job!

Now you can tell at a glance the correct KENNEDY Valve to use on a specific job . . . and why! These new valve Check-Charts show you the important features of the various types of KENNEDY Valves and explain their proper installation and use. Show you which valves go where . . . list specific Figure Numbers for accurate selection . . . describe why that valve should be used . . . and even suggest additional uses for Kennedy Valves.

One chart describes Kennedy Bronze Valves and its companion chart lists uses and conditions for Iron-Body Valves.

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Light Duty Thickness (Ice Water)	to 30° F
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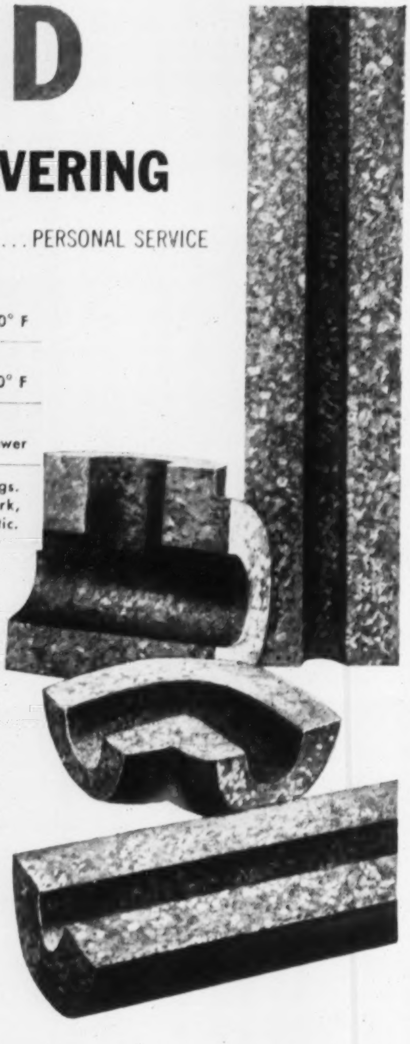
For all standard pipe sizes and fittings. Molded of compressed pure granulated cork, finished with moisture-proof mineral mastic.



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Engineering offices, or approved distributors, in key cities — coast to coast.

RECENT TRADE LITERATURE

Continued

▶ *PUMP*—New 6 page folder discusses compressed air operated "Ejectopump," designed with no glands, no bearings, no moving parts, requiring no lubrication. Literature shows cutaway views, tells how it works. Ferro Corp., Supplies Div., 4150 E. 56th St., Cleveland 5.

▶ *PUMPS*—Data sheet 955 details company's general purpose bronze positive displacement pump. Includes information on basic models available, choice of materials of construction, capacities, impeller materials, motor mounts, bases, drives. Eco Engineering Co., 12 New York Ave., Newark 1.

▶ *PURGE METERS*—New 8 page bulletin No. 120 describes company's "Brooks-Mite" and "Sho-Rate" purge meters. Application data, design and construction details, capacity charts included. Brooks Rotameter Co., Lansdale, Pa.

▶ *SIZING REGISTERS, GRILLES, SUPPLY OUTLETS*—Selection table for sizing registers, grilles, supply outlets designed for engineers, architects, contractors. Six page folder includes instructions for use. Waterloo Register, Inc., P. O. Box 72, Waterloo, Ia.

▶ *SNOW MELTING*—*Are Thermal Stresses a Problem in Snow Melting Systems?* defines inherent stress problem that exists using materials with slightly different coefficients of thermal expansion. Explains three major design precautions necessary to minimize effects of these stresses and eliminate harmful results. National Tube Div., U.S. Steel Corp., 525 William Penn Pl., Pittsburgh 30.

▶ *SPRAYED COIL DEHUMIDIFIERS*—New 20 page bulletin 7827 describes central station type sprayed coil dehumidifiers. Features 10 page section of application data. Outlines

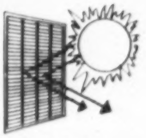
Los Angeles County Engineers Building
SAVES $13,300 in AIR CONDITIONING
with KOOLSHADE SUNSCREEN

Problem: The Los Angeles County Engineers Building was to be air conditioned. The building was equipped with Venetian blinds, but the engineers investigated several other window-shading devices in search for one that would do a better job of cutting air conditioning requirements.

Solution: Tests proved that solar heat transmission through the blinds—even when tightly closed—amounted to 1,102,000 BTU's. With KoolShade, only 232,000 BTU's. In refrigeration requirements, the difference amounted to 72 tons! Costwise, this reduction in tonnage adds up to a net saving of $13,300 over and above the cost of the KoolShade . . . and to this must be added the substantial annual savings from lower operation and maintenance of the cooling equipment.

By keeping the heat and glare of the sun *outside* the building, KoolShade Sunscreen eliminates hot spots and excessive loads . . . provides a balanced and trouble-free installation.

Only KoolShade Sunscreen offers



- **unsurpassed shading efficiency** keeps up to 87% of the sun's rays off windows during the hottest part of the day. 100 sq. feet of KoolShade reduces air conditioning load 1 ton.
- **80% clear visibility**—admits maximum glareless light.
- **harmony with all architecture**—improves building's appearance.
- **virtually no maintenance**—constructed of strong preoxidized bronze strips, wired and framed together, lasts for years, withstands hard blows.

Send today

for this detailed and illustrated bulletin. And for expert help in cutting costs and sun problems, just request a call from a KoolShade engineer. No obligation or charge.

Distributor franchise still open in many communities for those who qualify.

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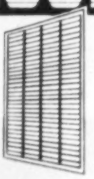

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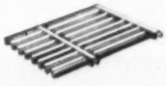

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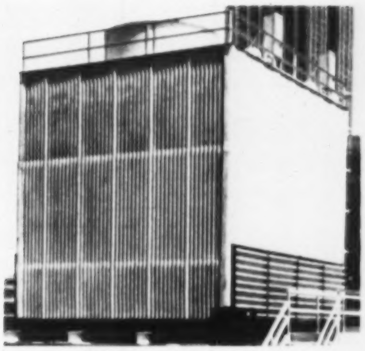
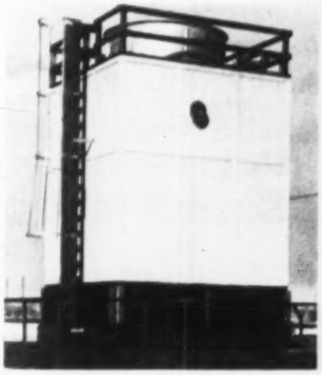


The Phillips Transite Cooling Towers have been in operation over nine years and proven to furnish the required cooling with lowest possible maintenance cost. Phillips Towers are available with framing of California Redwood or Hot Dipped Galvanized Steel as preferred.

The new Phillips nailless fill adds to simplicity of erection and maintenance.

The Phillips eliminator system guarantees minimum drift loss.

When you have a cooling problem call your Phillips representative.



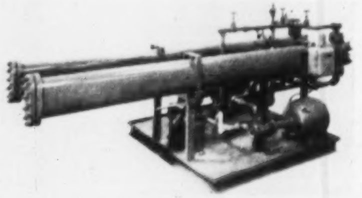
Phillips Cooling Tower Co., Inc.
220 DUPONT ST., BROOKLYN 22, N. Y.

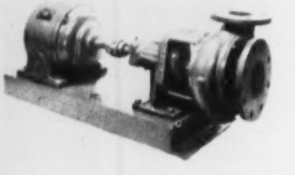
GOT A LIQUID TRANSFER PROBLEM?
USE
EAGAN PUMPS

The Eagan pumps pictured and described below are a big bargain from a performance, construction and price standpoint. They're designed to meet and exceed your liquid transfer requirements as they do for users throughout many different industries.

CONDENSATE PUMPS. Capacities to 100,000 sq. ft. EDR at 200 psi. Five types of units to meet all operational requirements and specifications. They include units with overhead receivers for high temperatures as well as underground receivers for buried returns, steel, cast iron and lined receivers.

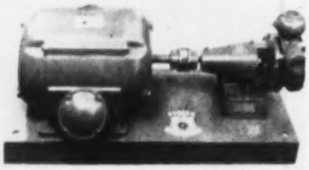
FUEL OIL PUMP AND HEATER SETS for combustion preparation of heavy industrial fuel oil. Packaged units, delivered ready to operate including integral temperature and pressure controls. They heat to 300° F., pump up to 400 psi., have capacities to 3000 gph. are easily installed, serviced.

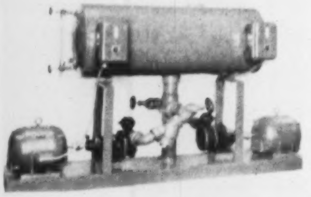




CENTRIFUGAL PUMPS. Heavy duty, two ball bearing construction. Includes valuable service features of renewable shaft sleeve and casing wearing ring. This centrifugal line will handle up to 1100 gpm. and discharge at pressures to 200 ft.

TURBINE PUMP Made for capacities to 200 gpm. at pressures to 200 psi. in many metals for corrosive chemicals as well as water. Incorporates preloaded bearings to permit positive centering of impeller without lateral bearing play. This permits high speeds without excessive wear.





BOILER FEED PUMPS. Packaged units designed to combine the function of boiler feeding and fresh water make-up. High receiver prevents flashing when traps begin to leak. Made in single and duplex construction for capacities to 100,000 sq. ft. at 200 psi.

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RECENT TRADE LITERATURE

Continued

design, construction features. American Blower Corp., Detroit 32.

▶ *STAINLESS FASTENERS*—New 52 page data book thumb-indexed for easy reference. First part of book includes illustrations, thread and size specifications in corrosion-resistant metals of 40 basic fastening devices. Second part consists of engineering data relating to composition, properties, applications, etc. Allmetal Screw Products Co., Inc., 821 Stewart Ave., Garden City, Long Island, N.Y.

▶ *STANDARD CONVERSION TABLES*—Bulletin F7255 gives thermocouple temperature-millivolt equivalents. Temperatures expressed on 1948 International Scale. Electromotive force expressed in absolute units. Barber-Colman Co., Wheelco Instruments Div., Rockford, Ill.

▶ *STEEL TUBING*—New 8 page folder TB-408 contains listing of company's complete line of tubing. Includes brief description of various kinds of technical literature available from company on specific types. Contains table of chemical analyses, physical properties, mechanical properties, creep strength of 20 steels. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.

▶ *SWAGED HOSE ASSEMBLIES*—New 8 page catalog S-1 shows company's complete line of swaged hose, hose ends, adaptors. Also featured is simple, detailed swaged hose assembly numbering system. Weatherhead Co., Fort Wayne, Ind.

▶ *SYSTEM ENGINEERED COMPONENTS*—New 8 page catalog No. 300-A includes capacity tables, dimensions, drawings for shell and tube condensers, shell and coil condensers, heat exchangers, liquid receivers, remote storage type water coolers. Acme Industries, Inc., Jackson, Mich.

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● Doubled manufacturing and warehouse space permits Peerless to warehouse twice as many fans and blowers and increase our number of models from 250 to more than 400. Now, when you need the equipment for a complete air moving job, you can come to just one source — Peerless — and get prompt delivery on everything you need.

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Peerless builds to all industry standards — both PFMA, NAFM and NEMA. If you require construction to meet other codes — either special industry or government — Peerless can do the job.

Engineering is the backbone of Peerless progress. With our new facilities, it will push our standards to an even higher level. Whether your installation problem is routine or complex, we'll work with you to solve it most efficiently.

The best way to start any air moving job is to consult the Peerless Fan and Blower Bulletins. SDA-160 gives complete data on fans and forward curve blowers. SDA-200 completely catalogs Peerless backward curve blowers. Put them in your file today. If you don't have them, write to us. We'll send them by return mail.

FAN AND BLOWER DIVISION

THE *Peerless Electric* COMPANY

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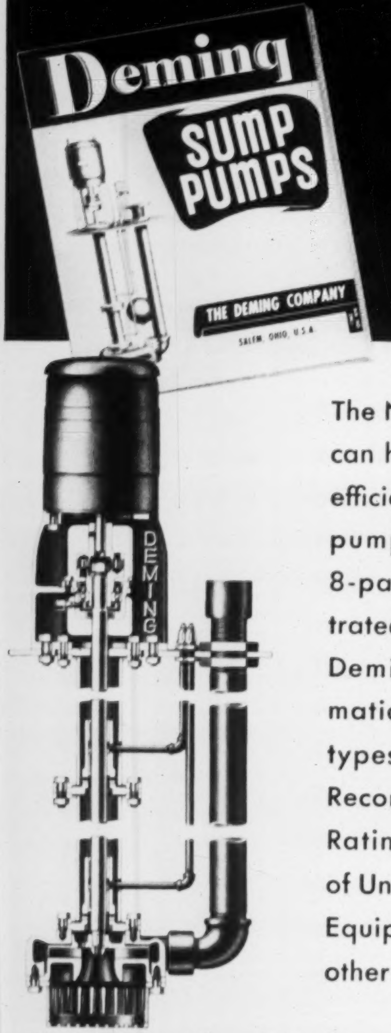

SUMP PROBLEM?

New DEMING Sump Pump Bulletin 4500 Can Help to Solve it!

The New Deming Bulletin 4500 can help you to select the most efficient unit for a specific sump pump job. Contents of the 8-page bulletin include illustrated construction features of Deming Sump Pumps, information on Single and Duplex types, Size and Horsepower Recommendations for Various Ratings, Standard Dimensions of Units, information on Control Equipment, Specifications and other useful data.

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Please send free copy of your Sump Pump Bulletin No. 4500.

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City ____________________ Zone ______ State ______

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RECENT TRADE LITERATURE

Continued

▶ *TEMPERATURE CONTROLLER* —Specification sheet 866 describes new "Ambi-Stat" remote bulb temperature controllers designed to provide close control with compensation for temperature differences between controlled medium and air surrounding tubing and bellows. Minneapolis-Honeywell Regulator Co., Wayne and Windrim Aves., Philadelphia 44.

▶ *VIBRATION MOUNTINGS*—Heavy duty steel spring vibration mountings described in catalog No. SS-55. Construction details covered. Load capacities, dimension tables, illustrations of typical installations included. T.R. Finn & Co., Inc., Industrial Div., 200 Central Ave., Hawthorne, N.J.

▶ *WATER LEVEL INDICATOR*—New 4 page folder discusses company's remote water level indicator of manometric type with automatic temperature compensation. Diagrams show typical installations. Yarnall-Waring Co., 101 Mermaid Ave., Philadelphia 18.

▶ *WATER SOFTENERS*—Water softeners for industrial plants, institutions, commercial establishments described in bulletin MSP-123. Cutaway drawings illustrate construction, indicate connections by which softener is fitted into water system. Hagan Corp., 323 Fourth Ave., Pittsburgh.

▶ *WELDING*—Literature discusses company's method of resistance welding in manufacturing air conditioning units. Results in increased production, less manpower, says company. Sciaky Bros., Inc., 4915 W. 67th St., Chicago.

▶ *WIRE ROPE SLINGS*—Wall chart lists diameters, lifting capacities of wire rope type slings. Measuring 17 × 21 in., chart designed to be displayed in prominent place in industrial plants. Wire Rope Sling Dept., American Chain & Cable Co., Inc., Bridgeport 2, Conn.

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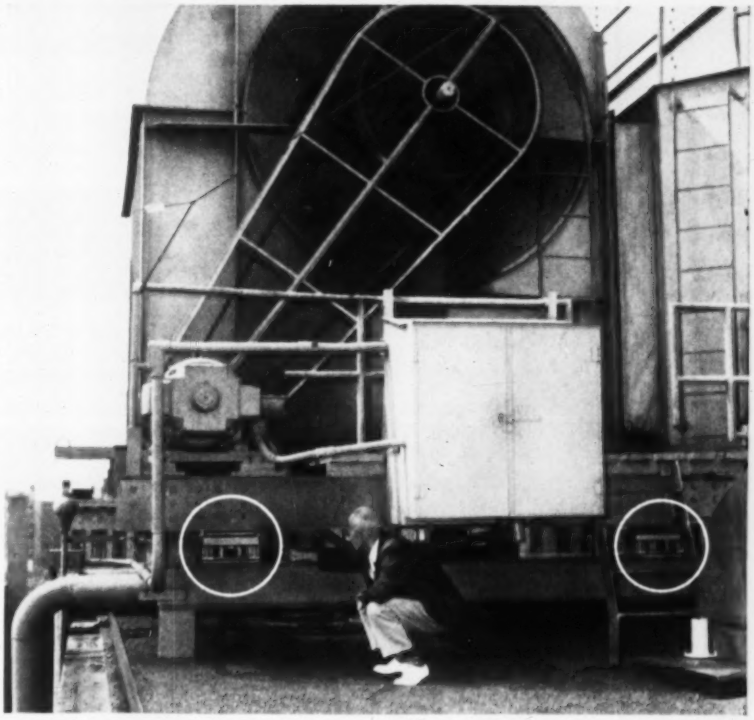
KORFUND
VIBRATION CONTROL



Means MORE ROOMS FOR RENT

The ability to utilize every inch of available space is sometimes the difference between profit and loss in building management.

The photo shows a fan installation on the roof of a famous hotel. Until the Korfund Steel-Spring Vibro-Isolators were installed, twenty rooms on the floor below could not be rented because of vibration. Even water standing in drinking glasses showed a decided side-to-side movement. The simple rubber pads installed previously just couldn't do the job.

Correcting faulty vibration control installations such as this, and recommending the right way the first time is made possible by experience. Korfund has more than a half-century of experience in the vibration control field. So when you have a problem, bring it to Korfund—you'll get impartial recommendations on media, whether it be springs, rubber, or cork, alone or in combination. Our experience will tell us which is best for you. And after all, there is no substitute for experience. Korfund can help you solve your vibration problem.

Write for a copy of the booklet "Air-Conditioning Goes Up in the World" which tells how to increase profits through vibration-free upper floor installations. Ask for Bulletin 32.

For specific recommendations, contact us or one of the 46 local Korfund offices. Look under "Korfund" in your local Telephone Directory or in Thomas' Register.

THE KORFUND CO., INC.

KORFUND VIBRATION CONTROL

SPRINGS RUBBER CORK

48-01F Thirty Second Place, Long Island City 1, N. Y.
In Canada: 510 Canal Bank, Ville St. Pierre, Montreal

WHO'S WHAT . . .

▶ *AMERICAN AIR FILTER CO., INC.*—W. G. Frank, president; W. M. Reed, chairman of the board; Ben R. Shaver, vice president and treasurer; E. G. Mason, secretary. Messrs. Frank and Reed were executive vice president and president, respectively. The post of chairman of the board is newly created.

▶ *NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION*—Reelected officers are: G. W. Denges, president; F. L. Meyer, first vice president; Tom Byrd, second vice president; George Boeddener, secretary-treasurer. New trustees for two years are:, W. J. Olsen, David E. Sedgwick, G. D. Heeringa, Walter C. Kremser. Trustees reelected to an additional term of two years are: J. F. Deane, S. J. Levine, E. A. Eichenberger, C. L. Sapp.

▶ *WALWORTH CO.*—George R. Galbraith, assistant vice president.

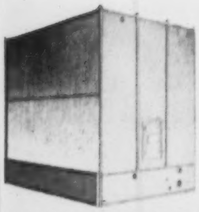
▶ *CARRIER CORP.*—Charles M. Stuart, "loaned" to the federal government for six months to direct activities of the general industrial equipment division of the Business and Defense Services Administration. Mr. Stuart is assistant to the executive vice president of Carrier.

▶ *AMERICAN SOCIETY OF REFRIGERATING ENGINEERS*—S. W. Brown, national chairman of technical committee dealing with marine air conditioning and refrigerating systems. Mr. Brown is head of the consulting engineering firm bearing his name.

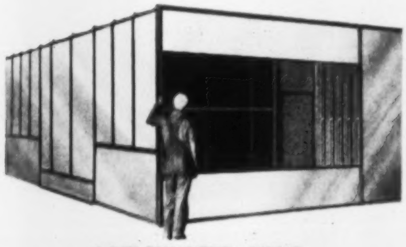
▶ *BORG-WARNER CORP.*—Fred S. Gombert, a vice president of Ingersoll Conditioned Air Div.; Robert F. Schutz, vice president and manager of Ingersoll Kalamazoo Div.; M. R. McLary, vice president of Ingersoll Products Div.; Donald R. Spotz, general sales manager of Pesco Products Div.

▶ *WESTINGHOUSE ELECTRIC CORP.*—Bruce D. Henderson, operating vice president and division manager in charge of air conditioning division; John A. Gilbreath, manager of packaged products of the division; E. N. Foss and P. J. Zilles, manager and sales manager, respectively, for newly created air cleaning products department of the Sturtevant Div.

▶ *PACIFIC FITTINGS DIV., GENERAL METALS CORP.*—William A. Flood, sales manager.

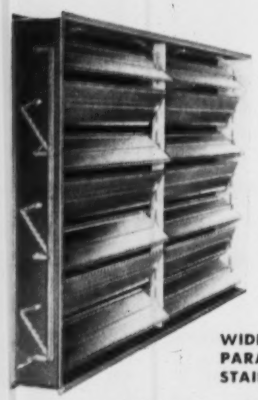

SPRAY AIR WASHER
SINGLE AND TWO BANK DESIGNS AVAILABLE IN A WIDE RANGE OF SIZES. FACTORY INSULATED CONSTRUCTION ILLUSTRATED

CAPILLARY AIR WASHER
CLASS I (CONCURRENT) SHOWN. CONSTRUCTED FOR 1000 TO 160,000 CFM THESE WASHERS OFFER PATENTED FEATURES FOR HIGHEST EFFICIENCY


ARTICULATED UNIT
THESE COMPLETE FACTORY INSULATED UNITS COMBINE PANELS, DAMPERS, WASHER OR SURFACE DEHUMIDIFIER AND OTHER FEATURES IN A SINGLE CO-ORDINATED ASSEMBLY.

AIR CONDITIONING EQUIPMENT

OTHER A & R PRODUCTS
FACTORY INSULATED PANELS
METAL CELL WASHERS
SPECIAL PURPOSE DRYERS

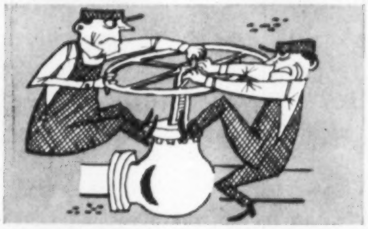

LOUVRE DAMPERS
WIDE FRAME CONSTRUCTION SHOWN. PARALLEL OR PROPORTIONING ACTION WITH STAINLESS STEEL SHAFTS AND BRONZE BEARINGS

A&R

AIR & REFRIGERATION CORPORATION
439 MADISON AVE. • NEW YORK 22, N. Y. • ATLANTA, GA.
SALES REPRESENTATIVES IN PRINCIPAL CITIES

Do you have to operate your **PLUG VALVE** *like this?*

Or do you have to use Two Men *to operate your* **GATE VALVE** *like this?*



then install the

G-A FLOWTROL VALVE

which can be operated

LIKE THIS

Standard-built for pressures up to 300 psi

Built to order for higher pressures

Sizes **2"** *to* **36"**

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Designers and Manufacturers of VALVES FOR AUTOMATION

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- **MATERIALS HANDLING**

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Sizes 3" to 36" ID Wide Pitch type *RETRACTABLE*

Flexaust hoses and Portovent ducts are made with strong cotton or nylon fabrics, impregnated and coated with neoprene compounds. Seams are fully bonded. Other important features are—

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HOSE

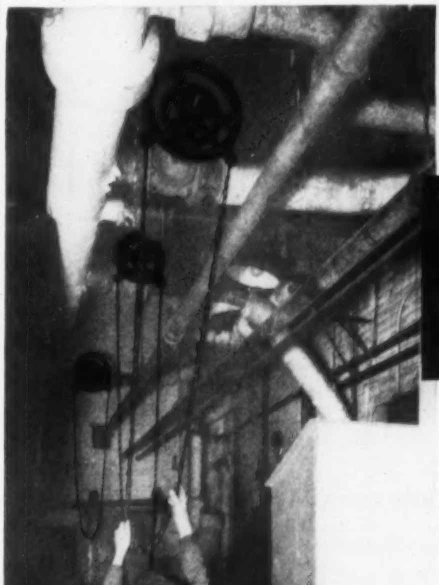
Sizes 1¼" to 36" ID Close pitch type

WRITE TODAY FOR

Bulletin #40 — General information
Bulletin #41 — Accessories and Installation Data
Bulletin #42 — Technical data on products and service.
Bulletin #43 — Application data and type selector guide.
Bulletin #44 — Friction loss data.
Prices lists.

THE FLEXAUST COMPANY, Dept. HP-1

100 PARK AVENUE NEW YORK 17, NEW YORK



Every Valve Easily Accessible with

Babbitt
—Adjustable—
SPROCKET RIM
with Chain Guide

NEWLY REDESIGNED for greater strength—easier, quicker, more solid assembly.

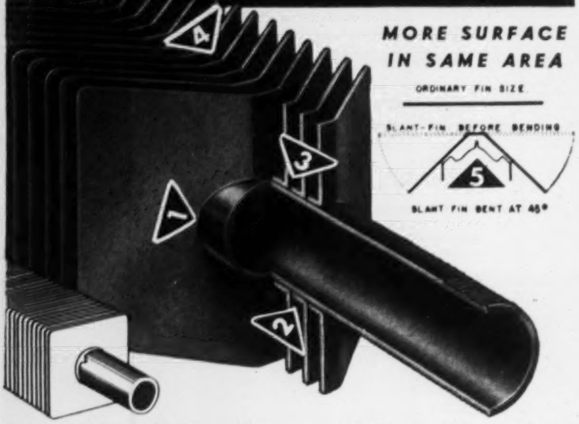
- **Simplifies pipe layouts**
- **Fits any size valve wheel**
- **Prevents accidents**

Your supplier carries complete stocks. Call him — or write for details and prices.

Babbitt STEAM SPECIALTY CO.

8 BABBITT SQUARE, NEW BEDFORD, MASSACHUSETTS, U. S. A.

SLANT-FIN
TELLS WHY THIS IS
BETTER
FINNED PIPE



Improved Design and Construction

IN BOTH "SLANT-FIN" AND "SQUARE-FIN" RADIATORS

1 **BETTER FIT OF FIN TO PIPE.** With exclusive equipment designed by Slant-Fin engineers, pipe is forced through undersize hole in fins under tons of hydraulic pressure. No weakening of pipe walls by expanding pipe or by fins cutting into pipe surface. The result is the **strongest mechanical union of pipe and fin.**

2 **PERFECT THERMAL BONDING.** On a special machine, standard pipe is rolled to uniform, absolutely round diameter. Wide flanges of fins press solidly against entire surface of pipe for **highest heat transfer efficiency.**

3 **PRECISION SPACING AND EXTRA STRENGTH.** For the flanges of the fins, Slant-Fin devoted much time to experimental engineering. Because of the uniformity of the flanges and their interlocking features, the **fins fit tightly one into another.**

4 **MORE EFFICIENT AIR CIRCULATION.** Because of the increased surface, **fewer** of the distinctive "V" shaped **slant fins** than the traditional square fins can furnish the same radiation per linear foot of pipe. Therefore, fins can be wider apart and a greater volume of air flows more freely.

5 **NO SNAPPING — NO BUCKLING OF FINS.** Because of the **patented notched flange,** the slant-fin can expand and contract without disturbing the bond to the pipe, even under high steam pressures. The result is a radiator that is trouble-free and **noiseless.**

RESIDENTIAL BASEBOARD HEATING
For Steam or Hot Water.
Choice of 3 Heating Elements
and 2 Enclosure Styles.

CATALOG No. 505 gives details on the complete line of "Slant-Fin" and "Square-Fin" radiators and enclosures for commercial and industrial applications. BULLETIN No. R-602 supplies facts about residential baseboard heating. Write for your copy.

SLANT-FIN RADIATOR CORPORATION
87-65 130th Street, Richmond Hill 18, New York

WHO'S WHAT

Continued

▶ *GENERAL CONTROLS CO.*—Douglas S. Sterner, manager of air conditioning-refrigeration division; S. Alfred Walker, public relations representative. Both Mr. Sterner and Mr. Walker are located at the company's offices at Glendale, Calif.

▶ *HEAT-X INC.*—Perley K. Barker, general manager. He was sales engineer for the company in northern New England.

▶ *POWERS REGULATOR CO.*—H. C. Mueller, elected to board of trustees of Illinois Institute of Technology. Mr. Mueller is Powers' president.

▶ *BUFFALO FORGE CO.*—Arthur M. Kiely, treasurer. He is also a vice president and a director of the company.

▶ *GENERAL ELECTRIC CO.*—Edgar B. O'Hora, manager of air conditioning and internal sales for company's small integral motor department. In GE's distribution assemblies department: S. S. Price, manager of panelboard and motor control design engineering; A. H. Adams, manager of switchboard and distribution center design engineering.

▶ *LENNOX FURNACE CO.*—Martin G. Beline, manager of industrial sales.

▶ *EMERSON RADIO AND PHONOGRAPH CORP.*—Abraham A. Vogel, a vice president; Maurice L. Levy, director of commercial engineering division; Morton E. Ornitz, special staff assistant to the president.

▶ *PITTSBURGH CORNING CORP.*—Walter Lovett, manager of company's newly created technical service department.

▶ *GLEN ALDEN CORP.*—Jules Alexandre, manager of the northeastern division of Mathes Co., Inc., a Glen Alden division.

▶ *B. F. GOODRICH CO.*—Wilfred A. Smith, manager of new products sales for company's industrial products division.

▶ *TRANE CO.*—John F. Karr, manager of market research.

▶ *WOLVERINE TUBE DIV., CALUMET & HECLA, INC.*—William Bothwell, an executive of the aluminum department. Don Zimmerman, an executive of the advertising department.

KEENEY IS HEADQUARTERS

FOR PRACTICAL DATA TO HELP SOLVE YOUR PROBLEMS IN

HEATING, PIPING & AIR CONDITIONING

Only HP&AC adequately covers all three fields each issue. Best evidence is last year's record: 191 feature pages on Heating . . . 166 pages on Piping . . . 400 on Air Conditioning—total 757 pages, or the equivalent of three books—plus 450 pages in departments and news.

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• CORRECT PRACTICE IN HEATING LARGE BUILDINGS

An all-new second edition presenting practical heating data reprinted from *Heating, Piping and Air Conditioning*. An inspiring record of 37 foremost heating specialists' experiences. Actual installations that proved most efficient for hotels, stores, office buildings, hospitals, banks, churches, schools and colleges. Methods for enlarging or modernizing old systems—maintenance—fuel saving—sizing piping—temperature and boiler control—stopping building heat leaks, etc. Full, 8½" by 11" size. A lot for your money.
132 pages, $1.50.

• INDUSTRIAL AIR CONDITIONING HANDBOOK

Information on the purpose, cost, design, operation and maintenance of process and comfort air conditioning systems in manufacturing plants of many kinds. The combined knowledge and experiences of 33 prominent engineers, every one a designer or in direct charge of the largest factory air conditioning systems in operation. This shows other engineers how air conditioning helps speed production, improve products, and increase worker efficiency . . . also how to operate conditioning systems as economically as possible. If improvements and savings in any plant's air conditioning operations are possible, these data and ideas from other plants will certainly suggest the ways to make them.
186 pages, 8½" by 11", $1.50.

• INDUSTRIAL VENTILATION HANDBOOK

A practical manual on fume removal, dust collecting, ventilating and exhaust systems for industrial plants. Tells how to design correctly and provide for various ventilation requirements . . . make measurements and analyses of fumes, mists and dusts . . . plan exhaust systems, etc. Twenty eminent authorities contributed also to detailed descriptions of systems in actual operation in many plants, whatever the manufacturing process involved.
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Practical solutions to specific problems in all kinds of plants, factories, and mills—for changing, expanding, modernizing—planning maintenance—saving fuel—servicing boilers, oil burners—correcting corrosion—figuring heating requirements, also cost of steam—uniform heat control—converting to mechanical firing—snow melting systems, etc. Applications for heating, ventilaing, processing, drying—packaged steam generators—heat pumps—unit heaters—radiant panel heating—low-pressure steam—central heating. Articles by 28 heating engineers reprinted from Heating, Piping and Air Conditioning. Full size, 8½" by 11".
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6 NORTH MICHIGAN AVE., CHICAGO 2, ILL., U.S.A.

WHO'S WHAT

Continued

▸ *ARMSTRONG FURNACE CO.*—C. A. Murchison, manager of industrial sales.

▸ *WALWORTH CO.*—Joseph E. Mihm, assistant vice president. He will have charge of the company's West Coast operations.

▸ *BARRY CONTROLS, INC.*—Edward J. Lunney, chief engineer in charge of company's research and analysis department.

▸ *CUTLER-HAMMER, INC.*—H. F. Vogt, retired after 56 years active service; G. S. Crane, chairman of the board and chairman of newly created plans committee; Philip Ryan, president and chief executive officer; J. C. Borden, vice president and controller.

▸ *DRAYER-HANSON, INC.*—C. W. Pollock, chief engineer, commercial division. Mr. Pollock is rejoining the company after five years absence.

▸ *UNITED STATES AIR CONDITIONING CORP.*—Herbert E. Soderberg, manager of the order service department.

▸ *TUBE REDUCING CORP.*—C. L. Megargle, manager of specialty tube sales; Byron C. Hague, manager of bearing tube sales; T. L. Lee, manager of rock-drawn tube sales.

▸ *BARBER-COLMAN CO.*—John R. McCauley, appointed to application engineering staff of company's Wheelco Instruments Div.

▸ *A-P CONTROLS CORP.*—James Tate, assistant to the president; Duncan Henderson, administrative assistant in charge of sales. Both positions are newly created. Del Albright, in charge of sales engineering for the company's refrigeration and air conditioning controls division; Robert W. Sloane, heading sales engineering in gas and oil controls; Stanley Burghduff and John Rice, technical staff advisors in heating sales.

▸ *BULLARD CO.*—Francis L. Dabney, secretary and treasurer. Mr. Dabney succeeds Arther F. North, retiring.

▸ *PULLMAN VACUUM CLEANER CORP.*—Edgar Green, a vice president; John Daniell, sales director.

▸ *WALWORTH CO.*—D. Frank Mederos, vice president and assistant to the president.

In All This World

no finer air-conditioning than International as installed in

PALACIO TROPICAL ACAPULCO, MEXICO

All air-conditioning strives for the same goal: comfortable, controlled temperature. But there are two ways of achieving this goal . . . expensively and inconveniently, or efficiently* and economically.

Naturally, the latter method is the only right one . . . so naturally, International units were the right choice for such a prominent hotel as the Palacio Tropical, Acapulco, Mexico.

*No ductwork
Whisper-quiet operation
All aluminum construction

International MANUFACTURING COMPANY
Air Conditioning Division

CEILING HIDEAWAY
MODEL C.H.W. 90

600 E. GRAND AVENUE OKLAHOMA CITY, OKLAHOMA
CABLE ADDRESS "INTIME"

"I shot an arrow into the air,
It fell to earth, I know not where."

The Arrow and the Song—Longfellow, 1845

Longfellow a space buyer?

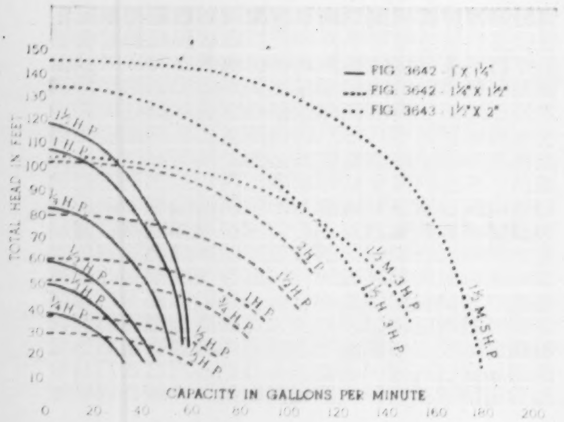
Longfellow's lament could well have been applied to advertising back in 1845. Yes, even up to 1914 when a group of advertisers, agencies and publishers, alarmed by the waste and guesswork in their business, brought order out of advertising chaos by organizing the Audit Bureau of Circulations. These pioneers in circulation auditing established a definition for paid circulation, rules and standards for measuring circulation, methods for auditing and reporting the FACTS. *For value-minded advertisers the era of blind space buying ended in 1914.* ☆ ☆ Today's experienced space buyers use the audited information in A.B.C. reports to aid them in applying media to markets and get full value for advertising dollars. Here are some of the FACTS in A.B.C. reports that provide a sound basis for advertising investments: • How much paid circulation • How much unpaid distribution • Occupational or business breakdown of subscribers • Where they are located • How much subscribers pay • Whether or not premiums are used • How many subscribers in arrears • What percentage of subscribers renew. ☆ ☆ Sales messages go direct to their targets, there's no shooting "into the air" when space buyers base their decisions on A.B.C. FACTS. This publication is a member of the Audit Bureau of Circulations because we want our advertisers to know what they get for their money when they use space in these pages. Ask for a copy of our A.B.C. report and then study it.

AUDITED PAID CIRCULATION
ABC
ABC Report

SEND THE RIGHT MESSAGE TO THE RIGHT PEOPLE

Paid subscriptions and renewals, as defined by A.B.C. standards, indicate an audience that has responded to a publication's editorial appeal. With the interests of readers thus identified, it becomes possible to reach specialized groups effectively with specialized advertising appeals.

A.B.C. REPORTS—FACTS AS A BASIC MEASURE OF ADVERTISING VALUE



These curves can lead you to pumping economy

If your pumping needs fit on this chart, these pumps will save money for you. Here are capacities to 180 GPM, heads to 145 ft., in the performance ratings of this line of Goulds "close-cupld" centrifugal pumps, designed especially for air conditioning service.

They're economically priced. They're simple to install. Their compactness saves space, and the 8-position casing gives flexibility in locating the discharge.

Better still, their efficient performance, and their long, trouble-free service, will continue to save money for your customers for many years.

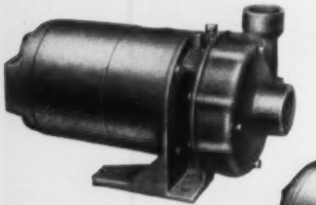


Fig. 3642, 1" size with ¼, ⅓, ½, ¾, 1, or 1½ HP motor. 1¼" size with ⅓, ½, ¾, 1, 1½, or 2 HP motor.

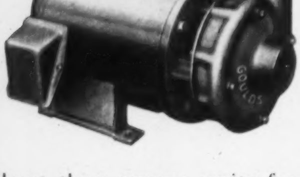


Fig. 3643, has 1½" discharge, available with 3 HP or 5 HP motor.

For additional details about these pumps, write for Bulletin 624.A-3.

Whatever your pumping requirements may be, there are Goulds pumps that will fill them economically and efficiently. We'll be glad to consult with you on any liquid-handling problem. Just write to Goulds Pumps, Inc., Seneca Falls, New York.

Goulds PUMPS INC.
Seneca Falls
New York

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK
PHILADELPHIA • PITTSBURGH • TULSA

WHO'S WHAT

Continued

▶ *L. O. F GLASS FIBERS CO.*—William L. Whitcomb, advertising manager; Raymond Petersen, manager of the combined customer service department. Customer service assistants are George C. Arnold, John M. Vanselow, A. J. White, and William F. Moll, Jr. Claude F. Harr, a member of the sales technical service department. Norman F. Heydinger will head the market research department.

▶ *DE LAVAL STEAM TURBINE CO.*—John D. Horth, assistant manager of compressor sales department; John M. Anspach, manager of foundry and pattern shop.

▶ *FAIRBANKS, MORSE & CO.*—Robert D. Brown, assistant secretary and assistant treasurer.

▶ *BUSH MFG. CO.*—Edwin C. Geishert, chief engineer.

▶ *O. A. SUTTON CORP.*—Charles V. Fisher, assistant sales manager for the commercial products division.

▶ *REIF-REXOIL, INC.*—Charles A. Reif, board chairman; Robert C. Sanderson, president and general manager; Norman Penney, secretary and a member of the board of directors.

▶ *CRISE CONTROLS DIV., ACRO MFG. CO.*—Charles M. Drenning, national service manager.

▶ *NIAGARA MACHINE & TOOL WORKS*—George E. Munschauer, chairman of the board and chief executive officer; Frederick E. Munschauer, Jr., president and general manager; Franklin A. Reed, vice president in charge of sales; Edwin A. Munschauer, treasurer and director.

▶ *L. O. F GLASS FIBERS CO.*—Bernard Katz, manager of systems and procedures and general office manager.

▶ *UTILITY APPLIANCE CORP.*—John L. Hall, manager of the company's contract division. He will handle construction, builder and architect sales.

▶ *BROOKS ROTAMETER CO.*—Seymour Blechman, executive vice president.

▶ *STOKER MANUFACTURERS ASSN.*—L. C. Dubs, reelected president; W. B. Baer, elected president and appointed chairman of membership committee. Mr. Dubs is president of Canton Stoker Corp. and Mr. Baer is vice president of Will-Burt Co. Donald J.

NEW *Ramset*®

DUO-JOBMASTER

gives you

TWO TOOLS IN ONE!

Ramset's new tool has interchangeable barrels, to set either ¼" or ⅜" fasteners into steel or concrete—an added convenience to the time, temper and money-saving advantages of Ramset Fastening System.

Will do all of your fastening jobs

Operator carries the second barrel in his pocket like a fountain pen, ready to set any variety of fasteners the job may require—light, medium or heavy duty anchoring into hard materials like concrete or steel.

Makes tough jobs easy

No more drilling or chipping; fasteners are set instantly, accurately and permanently with a press of the trigger.

Learn about this low-cost, time-saving, modern way to fasten. Find for yourself what it can mean to any construction job. A demonstration will convince you.

Ramset Fastening System
WINCHESTER-WESTERN DIVISION
OLIN MATHIESON CHEMICAL CORPORATION
FIRST IN POWDER-ACTUATED FASTENING

12109 BEREA ROAD • CLEVELAND 11, OHIO

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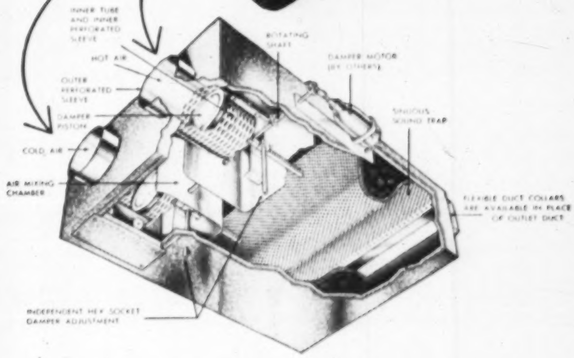
DUAL DUCT


INNER TUBE AND INNER PERFORATED SLEEVE
HOT AIR
OUTER PERFORATED SLEEVE
DAMPER PISTON
COLD AIR
AIR MIXING CHAMBER
ROTATING SHAFT
DAMPER MOTOR (BY OTHERS)
SINUOUS SOUND TRAP
FLEXIBLE DUCT COLLARS ARE AVAILABLE IN PLACE OF OUTLET DUCT
INDEPENDENT HEX SOCKET DAMPER ADJUSTMENT

HIGH PRESSURE DIFFUSERS

...how they work

Kno-Draft Dual Duct Air Diffusers are designed for central station high pressure systems where precise automatic compensation for fluctuations in inside and outside loads is required.

Warm and cold air are supplied through two separate ducts to a mixing chamber, which equalizes temperatures throughout the combined air stream. The outer perforated sleeves of the inlet dampers are operated by a thermostat-governed motor. They act simultaneously to control the proportion of warm and cold air and the delivered air temperature. In addition, each inlet tube has a damper piston which is adjusted separately for the different static pressure in each duct.

For example, the illustration shows a Kno-Draft Dual Duct High Pressure Valve with inlet dampers set for 50 per cent warm air and 50 per cent cold air. Static pressure in the warm duct is 3 in. wg; in the cold duct, 2 in. wg. So damper pistons have been individually adjusted to compensate for this difference. Fewer rows of perforations are exposed for warm air flow than for cold, keeping maximum warm and cold air volume equal and total air delivery constant.

For a more detailed explanation of Kno-Draft High Pressure Air Diffusers—both single and dual duct—write, on your letterhead, for a copy of Bulletin K33, an authoritative textbook on high pressure air distribution systems.

Connor Engineering Corporation, Dept. G-16, Danbury, Conn.

CONNOR
ENGINEERING CORPORATION
kno·draft®
adjustable air diffusers

WHO'S WHAT

Continued

Sprague, chief engineer for Canton Stoker, was named chairman of the association's engineering committee.

▶ *INTERNATIONAL NICKEL CO., INC.*—Edward P. Sadowski, research metallurgist in iron alloys section of company's research laboratory.

▶ *RESEARCH CORP.*—J. William Hinkley, executive vice president. He has served since 1951 as a vice president and secretary.

▶ *D. J. MURRAY MFG. CO.*—S. D. Payzer, elected to board of directors. Mr. Payzer fills the vacancy created by the death of D. C. Everest.

▶ *AMERICAN AIR FILTER CO., INC.*—Richard W. Smith, director of advertising. John McConnell will continue to serve as vice president in charge of advertising.

▶ *YORK-SHIPLEY, INC.*—James W. Vanderpool and John K. MacLean, special factory representatives. Mr. Vanderpool's territory is Maine; Mr. MacLean's is Rhode Island and southwest Massachusetts.

▶ *STRONG STEAM SPECIALTY MFG. CO.*—R. L. Clark, president; H. H. Maltbie, sales manager.

▶ *JOSEPH T. RYERSON & SON, INC.*—Napier B. Caldwell, sales manager for the Boston plant; Harold E. Stavers, sales manager for the Detroit plant.

▶ *WAGNER ELECTRIC CORP.*—Paul C. Ford, chief engineer of company's electrical division. He succeeds C. P. Potter, who is retiring after more than 46 years with Wagner.

▶ *PENNSYLVANIA SALT MFG. CO.*—Lee H. Clark, vice president. Mr. Clark is general manager of Pennsalt's Sharples Chemicals Div.

▶ *AIR-CONDITIONING AND REFIGERATION INSTITUTE*—Chester R. Venemann, a member of the institute's public relations staff.

▶ *AMERICAN GAS ASSOCIATION*—Bruce A. McCandless, assistant managing director.

▶ *ACRO MFG. CO.*—Douglas McIlvaine, director of research and development of new product lines.

▶ *JACKSON & CHURCH*—Howard K. Beck, president; F. C. Adams, vice president.

MECHANICAL ENGINEERS

What Should an ME Know About Atomics?

Quite a bit these days, with so many companies getting into the field. While many new firms are now starting to explore the field, Electric Boat Division of General Dynamics Corporation led the way with the building of the first nuclear powered submarines, Nautilus and Sea Wolf.

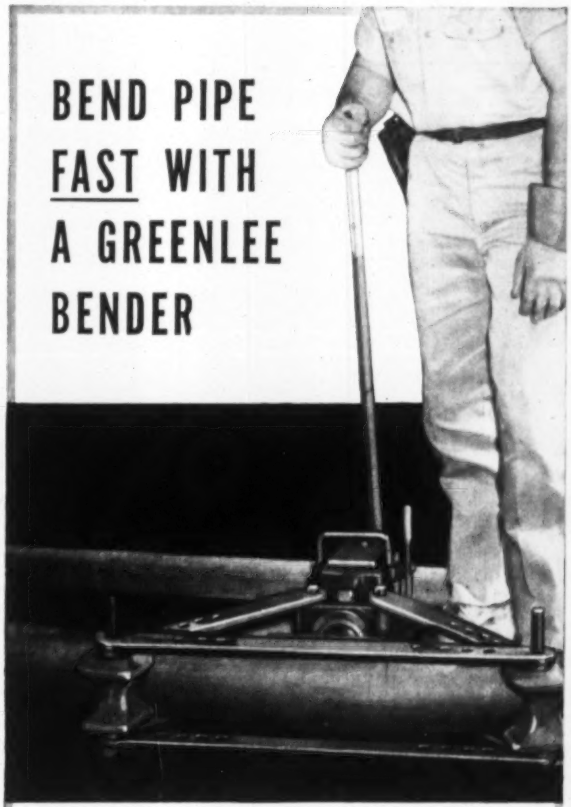
In addition to increasing its engineering force for work on new and greatly advanced nuclear submarines, Electric Boat is expanding Research and Development operations to include the development of additional practical uses for nuclear energy.

Right now Electric Boat has interesting positions for Mechanical Engineers with experience in vibration and shock, machine design, stress analysis, hydraulics, rotating machinery, power plants or air-conditioning and piping.

Study for bachelor's or advanced degrees is encouraged at Electric Boat, with courses in mathematics, naval architecture, nuclear engineering and nuclear submarine systems offered within the plant, and tuition paid by the company for study in these or other fields at leading colleges and universities.

Men interested in these openings should write complete details of background and experience including initial salary requirements. Interviews will be arranged promptly for qualified applicants. Address Mr. Peter Carpenter.

Electric Boat Division
GENERAL DYNAMICS CORPORATION
GROTON CONNECTICUT
near New London on the Connecticut shore



BEND PIPE
FAST WITH
A GREENLEE
BENDER

Built for the tough jobs, the Greenlee Hydraulic Bender saves hours, cuts costs on your piping work . . . smoothly bends *all sizes of pipe up to 5"*. With the Greenlee, *one man* quickly makes accurate bends "right on the job" exactly where and when needed! Many owners report labor savings of 50% and more . . . and the cost of many manufactured bends and fittings is eliminated. Compact, portable, versatile . . . use the same power unit with radius attachments for making radiant heating return bends. Two models. Portable power pump also available to put your bending on a fast "production line" basis. Reduce costs, speed jobs with the Greenlee Bender, which often pays for itself on the very first job. Get facts today.

TUBING BENDERS Swiftly produce accurate small-radius bends in tubing and pipe. No flattening or kinks. Especially designed to form neat bends to fit sharp corners and nooks and other close quarters. Various sizes and models for pipe, steel, copper, brass and aluminum tubing.

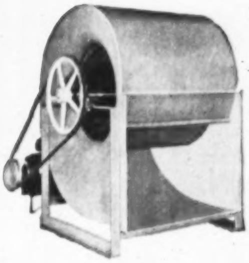
TOOLS FOR CRAFTSMEN
GREENLEE

Greenlee timesaving tools for plumbing and heating work: Hydraulic Pipe Pushers • Hydraulic Pipe Benders • Tubing Benders • Pipe Bits Auger Bits • Spiral Screw Drivers • Chisels • And many more
Greenlee Tool Co., 2341 Twelfth Street, Rockford, Illinois

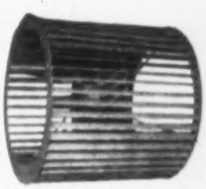
Cut your costs with
BARRY
Industrial
BLOWERS — BLOWER WHEELS — HOUSINGS
MULTIPLE BLOWER ASSEMBLIES

Yes, you can save because Barry blowers usually cost you less, yet you get highest quality materials and workmanship . . . and deliveries are surprisingly fast!

Barry blower wheels are precision made from either steel, stainless steel, copper, brass or aluminum, and are expertly balanced and trued. Many of the country's leading heating, air conditioning and ventilating equipment manufacturers use Barry blowers, or blower wheels and housings because they have found Barry a dependable, low cost source of supply.



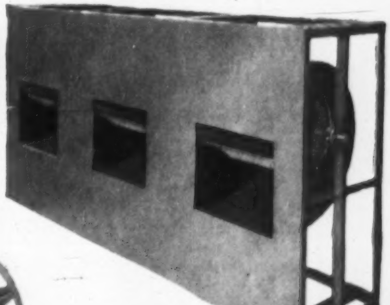
Double Inlet Blower



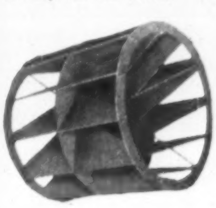
Double Inlet Forwardly Curved Wheel

● Built to YOUR OWN Specifications!

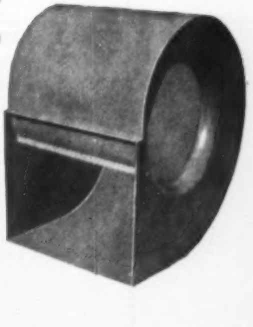
Single Inlet Backwardly Curved Wheel



Triple Blower Assembly



Double Inlet Backwardly Curved Wheel



Double Inlet Housing

INVESTIGATE for your own requirements. Send us your specifications for prompt, no-obligation quotation.

BARRY
BLOWER CO.
3100 California St., N. E.
MINNEAPOLIS 18, MINNESOTA

Quickdraft

Commercial models for smoke outlet diameters 12, 14, 16, 18, 20, 22, 24 and 30 inches.

22 INCH MODEL SHOWN

CURES NATURAL DRAFT TROUBLES

Increasing concentration of carbon and sulphur dioxides in the atmosphere, recently reported by scientists, handicaps ordinary chimneys by decreasing natural draft (CO_2 is 55% and SO_2 is 225% heavier than air) . . . and by demanding more draft because additional air is required to provide sufficient oxygen. In addition, current trends constantly demand more draft . . . (1) new fuels that require more oxygen . . . (2) longer flue travel in furnaces and boilers. As a result, more and more heating plants operate at low efficiency because of gravity draft troubles.

WITH POWER DRAFT THAT ASSURES HEATING PLANT EFFICIENCY

. . . No Fans or Motors in Smoke Line

Quickdraft power draft stops sooting, eliminates chattering, drys wet chimneys and greatly increases combustion efficiency. It does not obstruct smoke line with fans or motors. Quickdraft assures top performance from old and new heating plants. All models are approved by Board of Standards and Appeals, New York City. Write today for details.

Residential models for smoke outlet diameters 6, 7, 8, 9 and 10 inches.

N-286-QD

Quickdraft
COMPANY
Canton 1, Ohio

QUICKDRAFT COMPANY
Dueber-Hampden Building
P. O. Box 87-K
Canton 1, Ohio

WHO'S WHAT

Continued

- *KLIPFEL VALVES, INC.*—Nikolai Belaef, chief engineer.

- *SORENG PRODUCTS CORP.*—Frederick Morawetz, manager of research and development in company's central engineering division.

- *JOHNS-MANVILLE*—Arthur J. Bruno, head of the tapes and adhesives section at the company's research center.

- *LEWYT CORP.*—George Berk, sales promotion manager.

- *LEWYT CORP.*—Lou Stynes, regional manager in air conditioner sales.

- *OSTER MFG. CO.*—Robert C. Baumgartner, general sales manager. A. S. Gould will continue as vice president in charge of sales.

- *JOY MFG. CO., INC.*—Robert M. Van Tassel, head industrial designer.

- *LESLIE CO.*—Sten Soderberg, director of engineering.

- *TUTHILL PUMP CO.*—A. L. Caney, general sales manager.

- *WORTHINGTON CORP.*—William A. Finn, general manager of Holyoke Div.

- *PEERLESS MFG. CO.*—Marvin L. Stark, vice president in charge of engineering and development.

- *SERVEL, INC.*—H. Irving Pratt, a director.

- *HUCK MFG. CO.*—Donald R. Helson, assistant sales manager.

- *FOXBORO CO.*—Vincent V. Tivy, chief application engineer. He was manager of the company's refinery instrument sales.

IN THE TERRITORIES . . .

(Recent sales appointments)

- *WHEELCO INSTRUMENTS DIV., BARBER-COLMAN CO.*—Grant Edgel Co., representative for Portland, Ore. area; Ray E. Brainard, charge of Seattle area branch office at Bellevue, Wash.; Philip D. Herez, transferred from Cleveland to New York sub-

alive today

...because they went to their doctors in time

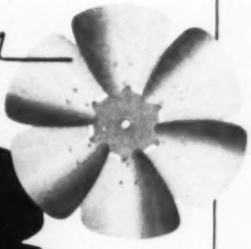
Many thousands of Americans are being cured of cancer every year. More and more people are going to their doctors *in time*. That is encouraging!

But the tragic fact, our doctors tell us, is that every third cancer death is a needless death...*twice* as many could be saved.

To learn how to head off cancer, call the American Cancer Society office nearest you or simply write to "Cancer" in care of your local Post Office.

American Cancer Society

Bronson



hi-static FAN BLADES

Also available with slinger rings and rubber hubs.

for higher air volume against static pressures!

Uses no more hp than conventional fan blades operating at same speed *but delivers more air when operating against static pressures!*

MANY FEATURES: Reduced blade depth. Filled-in center portion prevents back flow; wide range of blade curves for different pitches insuring maximum efficiency; calculated blade shapes and overlap for smooth entry, freedom from turbulence and elimination of dead center.

LOW NOISE LEVEL—Delivers more air at slower rpm's—reduces tip speed noise—no 60 cycle resonance.

PRECISION BUILT—Heavy steel spider, balanced aluminum blades, rivetted type construction.

Performance data available upon request.

The Bronson Hi-Static series is just one of many designs!

Wherever air is moved, there's a BRONSON FAN BLADE!

Pressure Series

Attic Fan Series

Offset Series

Free Air Series

Slinger Ring Series

Bronson

BRONSON FAN MANUFACTURING CORP.

Dept. H, 4560 Worth Street, Los Angeles 63, California

MOVE AHEAD with DU PONT

challenging, creative, remunerative CAREER OPPORTUNITIES for experienced

GRADUATE MECHANICAL ENGINEERS

Make the change now—meet the challenge of the future and your own development with a rewarding du Pont career. An industrial leader for 153 years, du Pont's keyword is continuing growth. Be a pioneer in du Pont's vast and diversified Engineering programs of today and tomorrow.

Apply today for immediate openings in the Design Division of du Pont's Engineering Department — one of the largest in the world, presenting opportunities for advancement and development through association with alert, creative minds of the highest calibre in all fields of engineering.

Fill one of the two immediate openings for Heating and Ventilating Designer-Engineer. One requires a minimum of four and the other nine years' experience in heating, ventilating, air conditioning, and process gas application as applied to industrial plants and service buildings. Applicable design experience should be in industrial temperature and humidity control; steam, refrigerant and condensate piping, ventilation, gaseous waste disposal, comfort air conditioning, heating systems and exhausts.

Successful applicants will design and engineer systems as outlined above and, in addition, be required to work on process gas facilities as required in complex chemical product manufacturing.

Please send complete resume,
including details of education
and experience to:

MR. T. J. DONOVAN
Personnel Relations Section
Engineering Department

DU PONT

Better Things for Better Living ...through Chemistry

E. I. du Pont de Nemours & Co., Inc.

Wilmington 98, Delaware

WHO'S WHAT

Continued

office at Clinton, Conn.; Kenneth Galloway and Charles B. Sticha, assigned to Chicago service staff; LeRoy E. Peterson, sales engineer at Chicago.

▶ *AUTOMATIC SWITCH CO.*—Conrad R. Baugh, representative for solenoid valves and electromagnetic controls in Nebraska, central and western Iowa; Southland Supply Co., Inc., distributor for solenoid valves in Dallas.

▶ *JOY MFG. CO.*—Detroit office has relocated to 17615 W. McNichols Rd.

▶ *ALL-STATE WELDING ALLOYS CO., INC.*—Charles Brown, manager of new southern division office at Birmingham.

▶ *BARRY CONTROLS, INC.*—Walter Fredrick, district manager for Canada, eastern United States except New England; Tom Black, district manager for western United States, New England; William Reed, sales office manager.

▶ *WALWORTH CO.*—George W. Newland, central division sales manager.

▶ *STURTEVANT DIV., WESTINGHOUSE ELECTRIC CORP.*—Alexander Martin, field sales manager; Philip Cohen, marketing services manager; Robert Mercer, northeastern regional manager; Hiram W. Rainey, Jr., central regional manager.

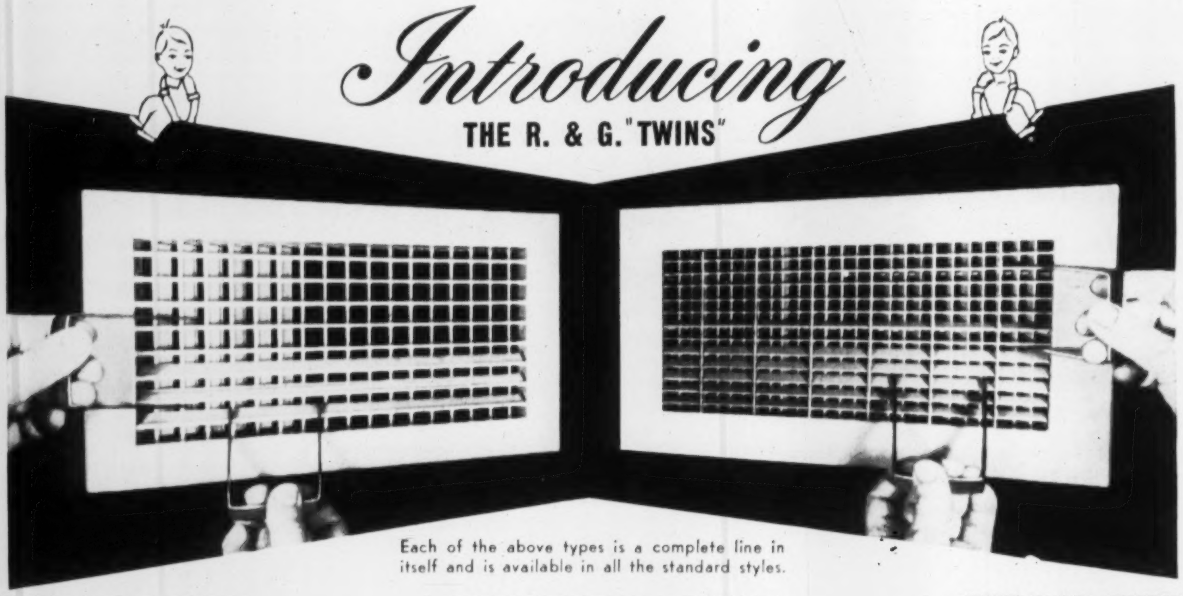
▶ *J. F. PRITCHARD & CO. OF CALIFORNIA*—W. H. Kidd, sales representative for Virginia.

▶ *K-G EQUIPMENT CO.*—New distributors and their locales are: Gordon's Welding Supply Co., Glens Falls, N.Y.; Joseph Hurwitz Co., Butler, Pa.; Temple Iron and Metal Co., Temple, Tex.; Travis Welding Supply Co., Dallas; Welding Sales Co., Orange, Conn.; WP-RS Mars Co., Duluth.

▶ *WORTHINGTON CORP.*—Elliott-Lewis Distributors, Inc., Philadelphia wholesale distributor for packaged air conditioners.

▶ *COPELAND REFRIGERATION CORP.*—John L. Zant, West Coast representative, has opened a new office in Pasadena, Calif.

▶ *OHIO BRASS CO.*—Valve sales representatives and their territories are: C. S. Bigelow & Assoc., southern California, southern Nevada; Associated Valve & Engineering Co., San Francisco, Reno areas.



Each of the above types is a complete line in itself and is available in all the standard styles.

THE BLADE TYPE

Air Conditioning type Registers and Grilles for the maximum in directional and volume control — Noiseless Operation — Strength and Beauty. Registers equipped with tamperproof opposed blade action, key operated shutters.

For QUALITY, STRENGTH, and DEPENDABILITY

in SCHOOLS
in HOSPITALS
in PUBLIC BUILDINGS

Dept. B

FREE Catalog on Request

Two complete lines of Registers and Grilles for HEATING • VENTILATING • AIR CONDITIONING

REGISTER & GRILLE MFG. CO., INC.
70 BERRY STREET, BROOKLYN 11, N. Y.

THE BAR TYPE

Solid 14 gauge adjustable bars make this style rugged and long lasting. Interlocking construction makes them tamperproof, adjustable only with the special tool provided.

Two NEW industrial heaters that mean MORE CONTRACTS for you

Easy to Install
Minimum Servicing
Automatic Operation

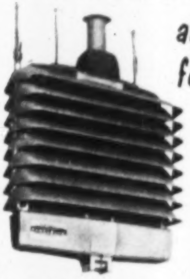
THERMOBLOC

DIRECT-FIRED HEATERS

The ideal warm air heater that heats large open buildings in all directions without ducts. Where necessary to heat individual rooms, THERMOBLOC is easily adaptable to ductwork.

THERMOBLOC is *fully* automatic and can be installed in a matter of hours. Available for either oil or gas. THERMOBLOCS are manufactured in nine models from 100,000 btu to 2,250,000 btu output. This means you can give your customers exactly what they need in heating capacity . . . fast!

Ask for Bulletin GC-4-55.



and "Bring the Sun Indoors" for your customers with...

PANELBLOC

GAS FIRED INFRA-RED
UNIT HEATERS

Heats like the sun . . . with gentle, healthful rays. Requires no fan or motor . . . no electrical connections. Installation requires only support from ceiling and hooking up to fuel supply and vent. Unit burns any commercial type gas fuel. You can guarantee customers will keep warm even when power lines are down.

Infra-red rays radiate to the spot you want to heat. PANELBLOC heats only personnel and machines or other objects . . . not air.

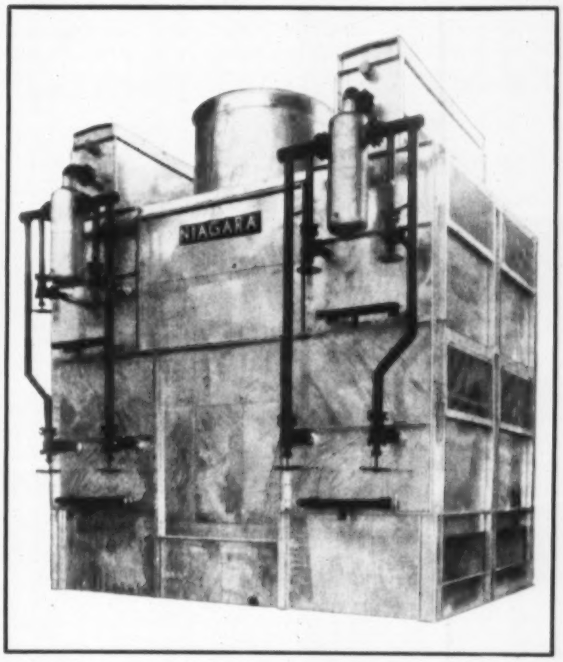
Heat is not deflected by draft or wasted in the ceiling. No moving parts mean less maintenance. Available in two sizes, 62,500 btu and 125,000 btu input. Ask for Bulletin P-154.

You can please your customers and make more profits for your company by specifying THERMOBLOCS or PANELBLOCS, depending on the requirements of the installation. Contact Thermobloc Sales today.

THERMOBLOC
Division of
PRAT-DANIEL CORPORATION
5-11 Meadow St. · South Norwalk, Conn.

Prat-Daniel Corp.
5-11 Meadow St.
South Norwalk, Conn.
Gentlemen:
I would like to know more about ☐ THERMOBLOCS ☐ PANELBLOCS
Name ____________________ Title __________
Company ____________________
Address ____________________

Large refrigeration plants save money with NIAGARA high efficiency condensers



In size ranges from 100 to 450 tons refrigeration Niagara's "Super" Condensers save power, save large cooling water and water handling expenses and help the user avoid most of the upkeep problems and troubles of a refrigerating plant. Always full condensing capacity is assured by the "Duopass" pre-cooling coils which remove the superheat and bring about condensing at low temperatures. Complete accessibility assures labor saving, inexpensive upkeep.

NIAGARA BLOWER COMPANY
Dept. HP, 405 Lexington Avenue
NEW YORK 17, N. Y.
District Engineers in Principal Cities

Write for complete information.

Ask for Niagara Condenser Bulletins 123 and 131.

NIAGARA
AEROPASS CONDENSER
400-TON CAPACITY
and FLUID COOLER

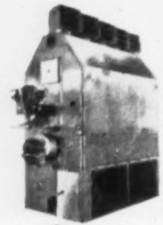
NIAGARA *Over 40 Years Service in Industrial Air Engineering*

COMFORT HEATING COMPLETELY AUTOMATIC

Unattended uniform heat around the clock . . . . and the cost of heating is sharply reduced with an Olson Heater. Let an Olson representative show you the "black and white" facts on how your plant or warehouse heating can be improved while the cost is reduced.

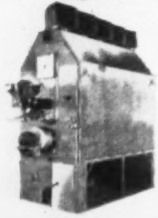
STAINLESS STEEL

Combustion Chamber is constructed of AUSTENITIC STABILIZED stainless steel. It provides an effective gas travel pattern and reverse current through a band of boiler tubes in the economizer section.



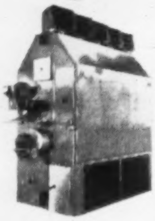
RUGGED CONSTRUCTION

Built solid and tough, designed for easy maintenance. Free from vibration and quiet running. All important adjustments and controls are on the outside within easy sight and reach.



SEPARATE DRAFT FAN

An important feature that eliminates cold air blasts at every start — allows separate control between main blowing fans and exhaust.



Manufactured in a variety of sizes for gas, oil or dual gas and oil. The initial cost is low compared to complicated systems and there is nothing to freeze during extremely cold weather. Needs no attendant because it is completely automatic. The industrial styling is trim, neat and requires little floor space. After many years of service it's easy to disconnect and move to another location to be put back into service.

Other applications for the Olson S S are: make-up air, drying adaptations, high temperature and process work. Easily adapted to duct systems.

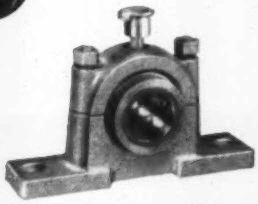
CAPACITIES
300,000
to
2,000,000
B.T.U. Output

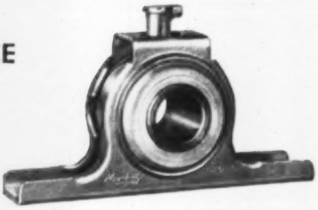
GAS, OIL
OR DUAL
GAS & OIL

Olson

ARTHUR A. OLSON & COMPANY
CANFIELD, OHIO
Representative in Principal Cities

FOR Automatic Protection USE Randall SELF-LUBRICATING PILLOW BLOCKS





SELF-LUBRICATING

SELF-ALIGNING

EXCELLENT SERVICE

MINIMUM MAINTENANCE

LONG LIFE

●

The proven design of Randall's self-aligning, self-lubricating pillow blocks is in keeping with today's trend toward more and more automatic type machinery and equipment. Every Randall pillow block utilizes the exclusive Randall "deep well"® ball assembly that offers a unique double lubricating principle. It combines Randall's exclusive graphited bearings with grease or oil type lubricants which assures controlled, automatic lubrication for long periods of trouble-free operation.

If you use bearings on your equipment it will pay you to investigate Randall . . . the most complete line of graphited bronze sleeve bearing pillow blocks available anywhere. Write us, today!

BRONZE BAR STOCK
BRONZE BUSHINGS
PILLOW BLOCKS
SHEET LUBRICATOR

Randall

GRAPHITED BEARINGS
THRUST WASHERS
SAFETY COLLARS
BRONZE CASTING

RANDALL GRAPHITE BEARINGS, INC.
1012 S. Greenlawn Ave., Lima, Ohio

WHO'S WHAT

Continued

▶ *TORK CLOCK CO., INC.*—New distributors and the areas which they will cover are: Olive Electric Supply Co., New Haven; Union Supply Co., Inc., Tallahassee; Loeb Electric Co., Columbus, O., Frank A. Blesso, Inc., Hartford; Dick's Electric Supply, Omaha; Scranton Electric Supply Co., Inc., Scranton.

▶ *KATHABAR AIR CONDITIONING DIV., SURFACE COMBUSTION CORP.*—J. B. O'Brien, sales engineer for eastern Michigan, western Ohio; J. R. Manier, a similar appointment for Canada, eastern Ohio, western Pennsylvania, and Buffalo, New York territories.

▶ *CENTURY ENGINEERING CORP.*—F. Lowell Curtis, greater New York district sales manager.

▶ *CONDENSER SERVICE & ENGINEERING CO.*—Merrill and Co., Midwest representative.

▶ *BUSH MFG. CO.*—Jack F. Wasson, sales engineer for eastern Michigan, northwestern Ohio area.

▶ *U.S. AIR CONDITIONING CORP.*—Frank D. Klein and Henry Rollens, southwest and northeast regional sales managers, respectively. R. E. Gray has been named vice president of Harry F. Haldeman Inc., usAIRco's southern California distributor.

▶ *PACIFIC FITTINGS DIV., GENERAL METALS CORP.*—Roy Hollabaugh Co., representative for Oregon.

▶ *AMANA REFRIGERATION, INC.*—Ronald L. Withers, dealer development manager for eastern region; Matthew L. Ryan, a similar post for the Buffalo region.

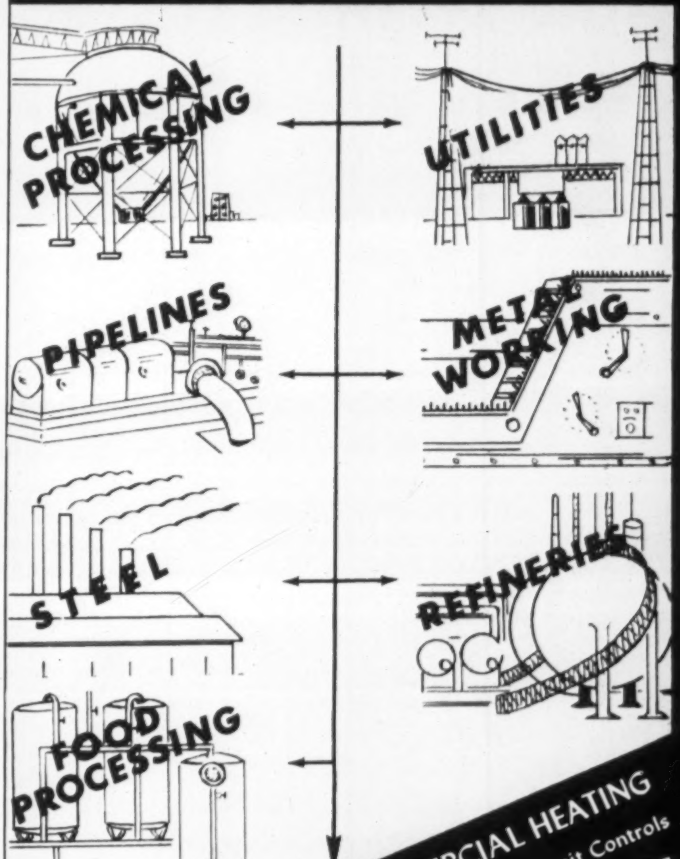
▶ *CONNOR ENGINEERING CORP.*—Samuel S. Neide & Assoc., representative for ceiling air diffusers in Maryland, Delaware, Virginia, West Virginia, the Carolinas.

▶ *UNION ASBESTOS & RUBBER CO.*—Appointments for the company's heating and cooling division are: F. J. Hearty and Co., southern California sales representative; William G. Huston, western regional sales manager; John T. Obrig, eastern regional sales manager.

▶ *ROCKWELL MFG. CO.*—William F. Gulley and Roy E. Nimtz, San Francisco and Seattle district sales managers, respectively, for company's meter and valve division.

- FOR SAFETY -
-LASTING PERFORMANCE-
- AT LESS COST -

MERCOID CONTROLS
FOR EVERY INDUSTRY



FOR RESIDENTIAL AND COMMERCIAL HEATING
Room Thermostats—Oil Burner Safety Controls • Safety Limit Controls

SEND FOR NEW CATALOG
THE MERCOID CORPORATION, 4201 BELMONT AVE., CHICAGO 41, ILL.
Send Catalog No. 856E to:
Name:
St. Address:
City & State:

UNMATCHED ACCURACY

in direct flow indication

Wherever you seek simplicity and high accuracy in flow measurement at lowest cost, the Meriam "H" Meter is the well-known answer.

Here is an easy-to-install flowmeter . . . free of all conventional service requirements . . . giving long-term economy as well as low initial cost. There are no pressure tight bearings . . . no magnetic followers . . . no stuffing boxes . . . no hysteresis problems whatsoever. No calibration is ever required, yet you have the highest accuracy available.

- ★ High operating pressures
- ★ High pressure differentials
- ★ All steel construction
- ★ Heavy duty glass enclosure
- ★ Built-in protection against line surges

Write for Bulletin 18A

Meriam Manometer Instrumentation ...for pressures, vacuums, flows, liquid levels.

meriam
INSTRUMENT COMPANY
10920 Madison Ave. • Cleveland 2, Ohio

WHO'S WHAT

Continued

▶ *KRITZER RADIANT COILS, INC.*—J. L. Myers Co., sales representative for northern California, northern Nevada.

▶ *CENTURY ELECTRIC CO.*—B. J. Gill, Northwest district manager, working out of new Spokane office; N. Cardella, director of new Birmingham district office.

▶ *E. H. TITCHENER & CO.*—R.S. Pettigrew and Co., sales representative for New England, excluding western Massachusetts.

▶ *L. O. F GLASS FIBERS CO.*—Richard H. Garnett, field representative in New York region.

▶ *HEAT-X, INC.*—Jack F. Wasson, sales engineer covering eastern Michigan, northwestern Ohio.

▶ *AIR REDUCTION SALES CO.*—W. M. Champion, district manager of Shreveport sales office.

▶ *GIBSON REFRIGERATOR CO.*—New regional sales managers and their territories are: William E. Brawner, New York, New England, eastern Pennsylvania; Arnold L. Kawsky, Chicago, Detroit, St. Louis, surrounding areas; Kenneth H. Luse, Ohio, western Pennsylvania, West Virginia, Kentucky, Tennessee; L. M. Gary, Virginia, Maryland, Delaware, the Carolinas.

▶ *DRAVO CORP.*—Richard J. Hollmeyer, Cincinnati district sales engineer, covering southern Ohio, Kentucky, southern Indiana; Wheeler M. Bearden, branch sales engineer at Indianapolis to cover most of Indiana, western Kentucky; Alamo Plumbing Supply Co., distributor for San Antonio marketing area.

▶ *McQUAY, INC.*—Alvin R. Close, heating and air conditioning representative in Toledo territory.

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This practical book is made up of outstanding papers and data on industrial piping selected from past issues of "Heating, Piping & Air Conditioning." It is a most comprehensive collection of case studies, showing how various difficult piping problems encountered in different industrial plants were successfully worked out by piping experts.

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SOUTH BEND AIR PRODUCTS INC
INDIANA

AEROSPOT
and
DYNAFLOW

Aerospot and *Dynaflow* fans rate high in efficiency and safety features . . . offer advanced aerodynamic design and rugged construction. The models shown enjoy wide popularity with industrial users. Any unit may be furnished with **explosion-proof** motor and fan blades.

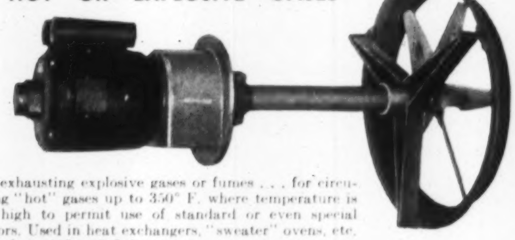
HEAVY DUTY AEROSPOT

For general or specific ventilation, man-cooling, or parts-cooling . . . to increase personnel efficiency and reduce lost time in cooling and drying hot parts. Portable . . . direction of blast adjustable. Explosion-proof motor, metal conduit and starter can be supplied. Conforms to state safety regulations.

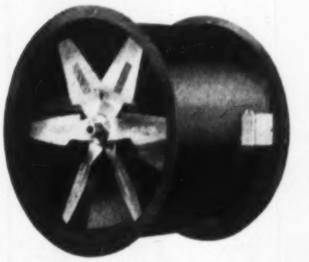
DYNAFLOW UNITS
2-4-6 BLADE TYPES

Six blade model illustrated. For exhausting or blowing against high static pressures. For general ventilation or specific processes where fumes are present. Sizes: 16" to 36" diameter. Capacities: 1240 to 26000 c.f.m. Two and four blade models available for applications at lower static pressures.

EXTENSION ARM DYNAFLOW FOR "HOT" OR "EXPLOSIVE" GASES



For exhausting explosive gases or fumes . . . for circulating "hot" gases up to 350° F. where temperature is too high to permit use of standard or even special motors. Used in heat exchangers, "sweater" ovens, etc. Fans from 16" to 36" diameters.



DUCTYPE UNITS
Direct Drive or Belt Drive

Direct drive model shown, also supplied with belt drive for high temperatures or corrosive air and gas handling. Designed for bolting in any duct run at any point or at either end. Sizes: 16" to 36" fans.

Send for complete specifications and listings of other fans available.

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Anemotherm
Air Meter
gives you all
vital readings with
P U S H B U T T O N
ease

Pays for itself through time saved on only one major job

The Model 60 Anemotherm Air Meter, developed by the Anemostat Corporation of America, gives you—*in one convenient instrument*—a simple, rapid method of balancing and checking any air system. It puts at your fingertips, by means of *color-coded pushbuttons*—

Air Velocity

Measures air velocities from 10 to 8,000 fpm, in increments as small as 5 fpm—a wider velocity range than ever offered before. It is essentially non-directional.

Air Temperature

Provides rapid-response measurement of temperatures from 0 to 255F. Temperatures can be read with an accuracy of one-half of one degree.

Static Pressure

Measures static pressures directly in terms of inches of water, from 0" to 10" wg. positive or negative, with a sensitivity of better than .05" at lower range.

The new Anemotherm Air Meter saves time and money. Write for Bulletin 55 giving all essential data.

AC 1336

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MANUFACTURERS OF
ANEMOSTAT DRAFTLESS *Aspirating* AIR DIFFUSERS

WE HEAR THAT . . .

▶ *HARV-O-METIC CO.* has been appointed to handle sales of the "Harv-O-Metic," *HARVILL CORP.*'s new hermetic compressor. Harvill, as manufacturer, is not engaged in its sale in any way and has set up Harv-O-Metic Co. as a national sales organization.

▶ *TYPHOON PROP-R-TEMP CORP.* has been merged with *HUPP CORP.* Prop-R-Temp's manufacture of heat pumps for commercial and residential heating and air conditioning will be conducted under its present name as a division of Hupp.

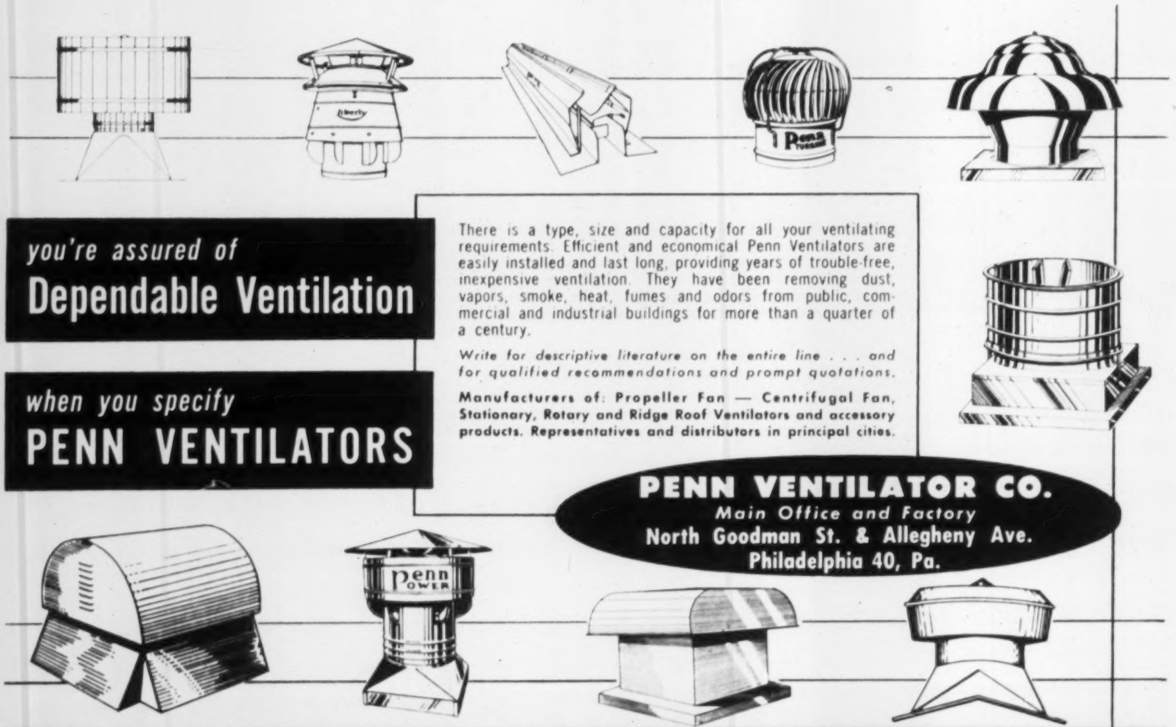
▶ *TED W. ERNST*, manager of the coil sales department of *TRANE CO.*, was a speaker at the 1955 Air Conditioning Institute at the University of Wisconsin recently. Mr. Ernst's topic was "Coils: Sizing, Selection and Application."

▶ As the result of an expansion program that includes the annexing of *METROTYPE CORP.*, *HAYS CORP.* has announced plans for reorganization. Under the new setup there is a Hays Div. and a Metrotype Div. The divisions will be under the managership of *DONALD R. SCHOEN* and *ROBERT E. NAVIN*, respectively. They will report directly to *PHIL SPRAGUE, JR.*, Hays' executive vice president.

▶ Controls and control systems are subjects of a training course at *COMBUSTION CONTROL DIV., ELECTRONICS CORP. OF AMERICA.* In addition to electronic combustion safeguards, the course covers control system wiring, modulating systems, automatic damper controls, and accessory equipment. Open to fuel burning industry servicemen and engineers, the course is free and the company provides hotel accommodations and meals for those attending. For further details, write to D. N. Fisher, care of the company, 718 Beacon St., Boston 15.

▶ Production of "Foamglas" cellular glass insulation will go up 50 percent, *PITTSBURGH CORNING CORP.* has announced. An enlarged continuous melting furnace, two roller hearth furnaces, two lehrs, ball mills, trimming machines, dust collectors, conveyors, bins and similar accessories will be installed at the company's plant in Port Allegany, Pa.

▶ *CANTON STOKER CORP.* has purchased the assets of *WAGENER STEAM PUMP CO.* Operating as a division of Canton Stoker, manufacture will be carried on under the name *WAGENER-SCHRADER PUMP DIV.* Present personnel will be retained and production continued in the Wagener plant until facilities are expanded to produce both lines at Canton Stoker.



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There is a type, size and capacity for all your ventilating requirements. Efficient and economical Penn Ventilators are easily installed and last long, providing years of trouble-free, inexpensive ventilation. They have been removing dust, vapors, smoke, heat, fumes and odors from public, commercial and industrial buildings for more than a quarter of a century.

Write for descriptive literature on the entire line . . . and for qualified recommendations and prompt quotations.

Manufacturers of: Propeller Fan — Centrifugal Fan, Stationary, Rotary and Ridge Roof Ventilators and accessory products. Representatives and distributors in principal cities.

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ELGEN *All-Tite* VANE RUNNERS NOW IN COILS!

OPEN THIS END
PULL HERE THIS END UP USE NO HOOKS
Save Time and Money... with ELGEN All-Tite
VANE RUNNERS

THE EASIEST AND QUICKEST WAY EVER DEVISED for installing single or double blade turning vanes in square elbows. No special tools required.

New production machinery of our own exclusive design, now enables us to produce button type Elgen All-Tite vane runners in continuous coils, effecting a savings in your cost per job.

COILED ELGEN ALL-TITE VANE RUNNERS MEANS . . .

- *Less Waste!* Waste pieces due to short ends are a thing of the past. Vane runner metal is coiled in 100 foot lengths, you just pull out the exact footage needed.
- *Easier Storage!* Each coil weighs approximately 50 lbs. and is packed in a box 28" x 28" x 5". Box fits easily under bench or against wall.
- *Easier Handling!* No loose pieces lying around to get in the way or collect dirt.
- *Unrolls absolutely flat!* Vane runner metal emerges from the box at bench height . . . absolutely flat . . . ready for use.

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ELGEN SILENT DUCT . . . for forming "flexible" duct connectors. A one piece metal to material unit, packed in coils, unrolls absolutely flat. Makes on the spot work a cinch.

ELGEN DAMPERSET . . . for multi-blade dampers, parallel or opposed. Most perfect damper hardware developed.

ELGEN PRODUCTS ARE SOLD THROUGH LEADING JOBBERS EVERYWHERE.

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and
HENDRICK
Serves Them ALL!

That's right! Hendrick serves every one of the 21 basic industries designated by the U. S. Department of Commerce under its Standard Industrial Classification list. If you have a perforating problem and are not already familiar with Hendrick's facilities, we stand ready to serve you, too!

Whatever your needs be, if you wish to perforate metal, rubber, plastic or masonite for a screening, straining, decorative, display or acoustical application, Hendrick's long experience can be of real help. Join the long list of manufacturers who now derive untold assembling and selling benefits by using Hendrick Perforated Metal as a fabrication material. Call Hendrick today.

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48 DUNDAFF ST., CARBONDALE, PA. • *Sales Offices in Principal Cities*
Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

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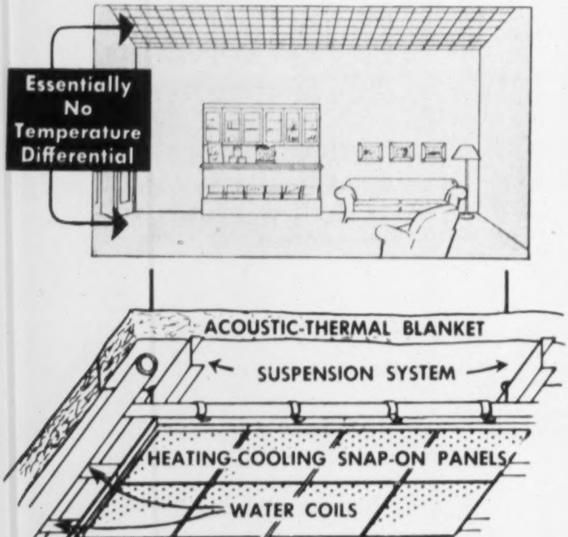
BURGESS-MANNING
3-Way Radiant Panel Functional Ceiling?

Your clients will be asking!

Yes — word is getting around, as it will when something really good makes its appearance. Here is the most modern, efficient and economical method of heating, cooling and acoustic control ever devised — it's easy to layout, easy to install and competitive in cost. No other method can provide the same uniformity of temperature with essentially no differential from floor to ceiling. It has never been done before. The Burgess-Manning 3-Way Radiant Panel Functional Ceiling is completely self-contained — suspended construction and fully automatic. Know the facts and be prepared to recommend and specify the method that offers a new versatility and substantial savings in space, material and fuel.


Essentially No Temperature Differential
ACOUSTIC-THERMAL BLANKET
SUSPENSION SYSTEM
HEATING-COOLING SNAP-ON PANELS
WATER COILS

Write for Bulletin A-129-H

Architectural Products Division of
BURGESS-MANNING COMPANY
5970 Northwest Highway, Chicago 31, Ill.

Manufacturers of 3-Way Functional Ceilings and Telephone Acousti-Booths

▶ *HEWITT-ROBINS, INC.* has acquired its fourth machinery plant—*W. A. JONES FOUNDRY AND MACHINE CO.*, Chicago, maker of speed reducers, pulleys, gears, and allied equipment. The 165,000 sq ft plant is now know as the Jones Machinery Div. of Hewitt-Robins.

▶ *EDMUND J. GRADY*, vice president in charge of the Pacific Steel Boiler Div. of *NATIONAL-U. S. RADIATOR CORP.*, has moved his headquarters from Detroit to Johnstown, Pa. This completes the transfer of the company's sales division.

▶ *HOOKER ELECTROCHEMICAL CO.* and its Durez Plastics Div. were made welcome to Kenton, Ohio, on "Hooker-Durez Day," October 13, when the Kenton Chamber of Commerce honored company officials at a luncheon.

▶ *PEERLESS PRODUCTS DIV.* of *UNITED COOLING TOWERS, INC.*, has opened a plant at 1421 E. Washington Ave., North Little Rock, Ark. The 20,000 sq ft plant will make draft-type water coolers for air conditioners.

▶ *GRAVER WATER CONDITIONING CO.* has expanded and decorated its offices at 216 W. 14th St., New York.

▶ A series of plant visits by distributors of *WEIL-McLAIN* products was started recently when a group from eastern Pennsylvania flew to the company's plant in Michigan City, Ind. The two day tour included views of the company's product development, manufacturing, and test methods.

▶ At a two day meeting in Chicago, 40 midwestern sales representatives had a preview of *UNION ASBESTOS AND RUBBER CO's*. 1956 line of heating and air conditioning products. New products described by *PETER B. COLWIN*, assistant general sales manager of the heating and cooling division, included commercial water chillers and a new 5 ton package unit.

▶ *RUDD MFG. CO.* has unveiled its general office building, conducted a national sales meeting, and sponsored an open house at its new Kalamazoo headquarters. Ruud had been in Pittsburgh for over 60 years.

▶ *ALLEGHENY LUDLUM STEEL CORP.* has opened a melting department for high alloy steel production. The consumable electrode vacuum melting facilities are expected to process 250,000 lb per month.

☆ ☆ ☆

Manufacturers' Agents

Are you interested in securing additional lines?

We are occasionally asked by our manufacturer advertisers to suggest the names of manufacturers' agents in various sections of the country whom they can contact in regard to representation of their industrial and large building heating, piping, and air conditioning products.

If you would like your name listed on our records for inquiries we may receive on your territory, we invite you to write us. There is no charge in connection with this service.

Heating, Piping & Air Conditioning

6 NORTH MICHIGAN AVENUE
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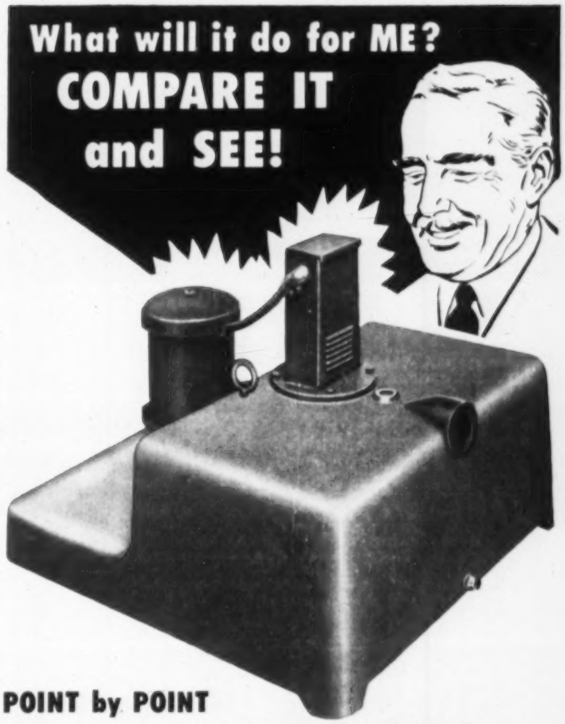
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COMPARE IT
and SEE!

POINT by POINT this new American-Marsh CONDENSATE RETURN UNIT gives more for your money!

Compare —

FLOATLESS ELECTRODE CONTROL — Top-quality, non-corrodible stainless steel rods and tips control pump. No moving parts, no float to stick or waterlog. More accurate control — trouble free for years!

EASY TO INSTALL — Above, on or in pit below floor. Just hook up piping and cable.

TOP-QUALITY PUMP — Balanced bronze impeller, mechanical seal, requires no lubrication. Quiet-running, tremendously dependable. Impeller removable without disturbing piping. Backed by 81 years' pump building know-how!

LARGER RECEIVER TANK — Lifetime cast iron, 16 gallon capacity. Low return inlet.

SINGLE OR 3-PHASE MOTORS — To suit your current. Drip-proof, ball-bearing design, high quality.

RANGE OF SIZES, TYPES — Single or duplex — order to suit your job! *Size 1* — to 5,000 sq. ft. EDR at 20 lbs. disch. pressure — 18,000 sq. ft. at 8 lbs. *Size 2* — to 9,000 sq. ft. EDR at 30 lbs., 18,000 sq. ft. at 20 lbs.

Compare THIS UNIT — for *permanent* satisfaction in school, store, hotel, office and apartment heating systems. Then —

DUPLEX UNIT

WRITE FOR COMPLETE DATA NOW! REQUEST BULLETIN CRU

AMERICAN-MARSH PUMPS

BATTLE CREEK MICHIGAN

In Canada:
American-Marsh Pumps (Canada) Ltd., Stratford, Ont.

CENTRIFUGAL, TURBINE, STEAM AND POWER PUMPS FOR TESTING, PROCESSING, BOILER FEED, FIRE PROTECTION, ETC

WE HEAR THAT

Continued

▶ *WALWORTH CO.* has purchased the assets and business of the *SOUTHWEST FABRICATING CO.*, Houston. Southwest will be a subsidiary of Walworth, retaining present management and continuing present policy.

▶ Judged as having the best annual report of the air conditioning and refrigeration industry for the fourth year, *CARRIER CORP.* recently received an "Oscar of Industry" from Financial World, national weekly magazine. The judges considered 5000 annual reports in 100 industrial classifications.

▶ The business of *DETROIT BRASS AND MALLEABLE CO.* has been acquired by a group headed by *RALPH S. GEDDES*, midwestern industrialist. The company is expanding its Wyandotte, Mich. plant and its Chicago warehouse facilities. Mr. Geddes becomes chairman and *M. A. MACBEATH* becomes president.

▶ Increased demands for gas appliance controls has resulted in a major expansion of *MINNEAPOLIS-HONEYWELL REGULATOR CO.'s* new $1 million factory in Gardena, Calif. considerably ahead of schedule. Officials of the company's appliance controls division announced that a new addition had been completed that will double operations. The original Gardena plant was completed just two years ago. The division produces controls for water heaters, floor furnaces, wall heaters and central heating plants.

▶ A new film on the submersible method of pumping is announced by *BYRON JACKSON DIV., BORG-WARNER CORP.* Titled "The Submersible Story," it is said to be the first complete factual story of the submersible pump—its history and development as well as its construction and operation. The company reports that the film may be obtained for showing.

▶ "Schoolroom Progress U.S.A." is the name of *CARRIER CORP.'s* mobile display which will make a nation wide tour of 250 major American cities. The company estimates that 3 million visitors to the exhibit's "old" schoolroom will enjoy the comfort of air conditioning—a relatively common feature of today's modern educational facilities.

▶ Work was started recently on a new warehouse for the *RALSTON STEEL CORP.* at Skokie, Ill., a Chicago suburb. The one story structure, with 40,000 sq ft of floor area, will be completed next May.

▶ *JOHN J. NESBITT, INC.* is planning a 34,000 sq ft shop and shipping addition at its plant in North Philadelphia.

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COMPLETE *SILENCE*
FOR YOUR ENTIRE
PIPING SYSTEM
WITH A

MILLER *STREAMFLOW* CHECK VALVE

CENTER GUIDED • SHOCK PROOF • ELIMINATES WATER HAMMER
ENTIRELY *NOISELESS* • FULL RADIAL FLOW
Certified Minimum Pressure Loss Curves Available • Sizes 1" through 24" Flanged • ASA Drilling • IBBM • Cast Steel • All Alloys

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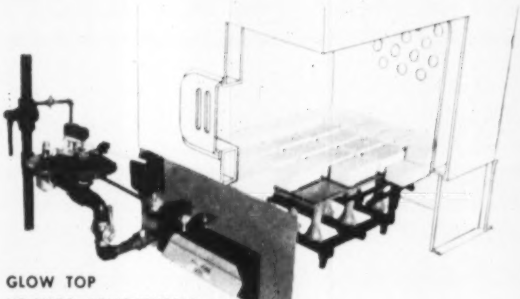
AGENTS IN PRINCIPAL CITIES

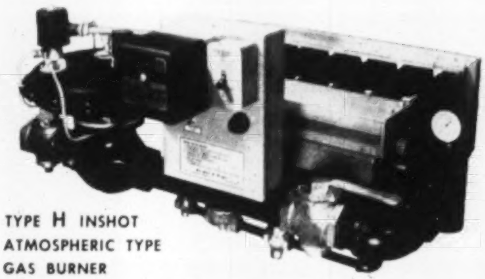
MILLER VALVE CO. INC.

P.O. BOX 1255 — PITTSBURGH 30, PA.
PLANT — 1620 PENNSYLANIA AVE.



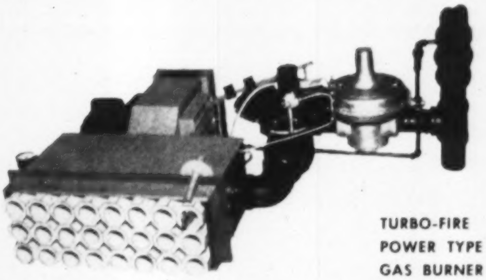
GLOW TOP
UP-SHOT ATMOSPHERIC
TYPE GAS BURNER

GORDON & PIATT GAS BURNERS



TYPE H INSHOT
ATMOSPHERIC TYPE
GAS BURNER

GORDON & PIATT GAS BURNERS



TURBO-FIRE
POWER TYPE
GAS BURNER

GORDON & PIATT GAS BURNERS

A Gordon & Piatt BURNER WILL FIT YOUR EXACT NEED . . .

For large heating boilers — The Glow Top Burner fires firebox boilers at maximum efficiency. No expensive combustion chamber required. Standard fire brick completely covers cast ports. Shape and capacity are flexible . . . 45 sizes listed in Catalog GT 55-1. Other sizes on application.

For marine boilers and other horizontal flame applications, the Type H Inshot Atmospheric Burner is the preferred type. 30 standard sizes listed in Catalog H-1, others on application.

Where forced draft is needed Gordon & Piatt offers the Turbo-fire power type gas burner. Refactory nozzles and distinctive air distribution give desired flame characteristics. Factory assembled with pre-wired control panel. Sizes listed to 18 million BTU/HR in Catalog FG-1.

GORDON & PIATT also manufacture a complete line of domestic conversion burners plus large dual fuel units. *Write for literature and complete information.*

Gordon & Piatt

P. O. Box 914
Winfield, Kansas

They SELL! They PLEASE!

AURORA

CLOSE-COUPLED

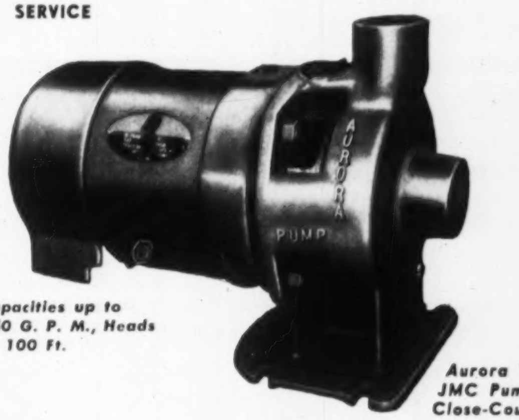
Packaged

AIR CONDITIONING PUMPS

for
**EVAPORATOR
COOLING
TOWERS**
•
**AIR
CONDITIONING
UNITS**
•
also for
**GENERAL
SERVICE**

These are outstanding pumps, high in favor with air conditioning contractors and manufacturers of air conditioning equipment. Mechanical seal requires no packing or maintenance. Disassembly without disturbing pipe connections or hold down bolts.

- LOW COST
- SMOOTH, QUIET
- DEPENDABLE
- LONG LIVED
- MECHANICAL SEAL
- DISASSEMBLY is QUICK, SIMPLE
- CARRIED IN STOCK



Capacities up to 150 G. P. M., Heads to 100 Ft.

Aurora Type JMC Pump — Close-Coupled

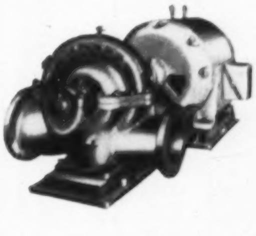
CASINGS vertically split. Casing wearing ring standard.

MECHANICAL SEAL—standard, located in packing cover.

IMPELLER — balanced, enclosed type, high grade bronze.

MOTOR—NEMA specs., stainless steel shaft on JMC — for all circuits and various enclosures.

BALL BEARINGS — on JMC, built into motor.



OTHER AURORA AIR CONDITIONING UNITS

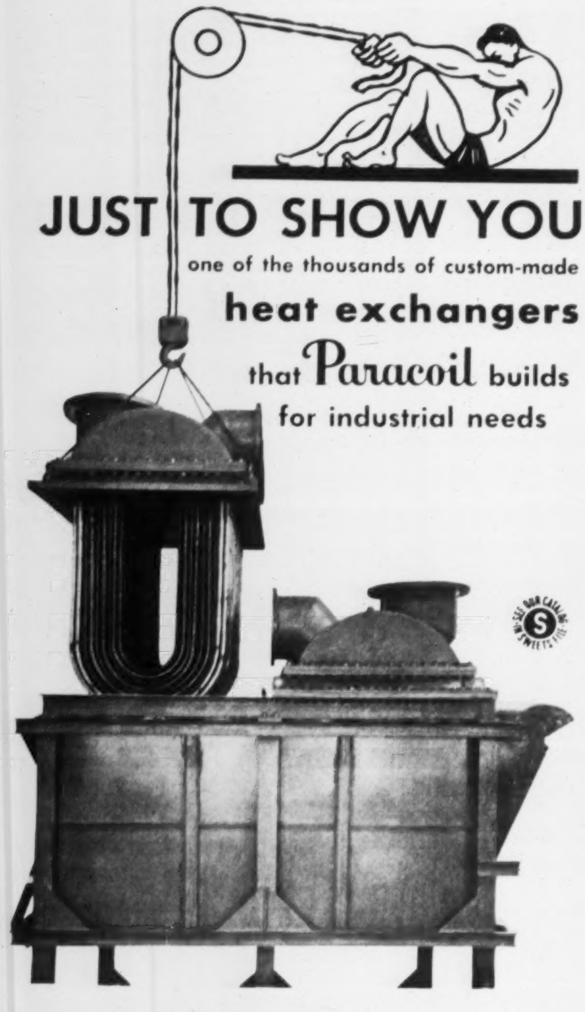
We are also in a position to supply various sizes of air conditioning pumps in V-Belt drive, and flexible coupling drive. Our large size type G.M.C. Close-Coupled Pumps can be furnished up to 800 G.P.M. and heads to 200 ft.

ALSO — AURORA SPLIT CASE CENTRIFUGAL PUMPS

— single and two stage for water supply, handling condenser circulating water, brine circulation, booster service and many other duties.

Complete Information on Request

AURORA PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY
80 LOUCKS STREET AURORA • ILLINOIS



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one of the thousands of custom-made

heat exchangers

that **Paracoil** builds

for industrial needs

A 13,000 cfm direct-fired air preheater being assembled at our Elizabeth plant. The stainless steel combustion chamber (not shown) sets below the tube banks. Air exit temperature 1000° F.

OUR EXPERIENCED ENGINEERS are available to expedite planning and specification work and to suggest the most suitable and economical exchanger design.

MODERN MANUFACTURING facilities and advanced techniques, skilled and seasoned shop personnel guarantee fabrication to rigid specifications.

FAST DELIVERY is assured by efficient shop work and immediate transportation facilities.

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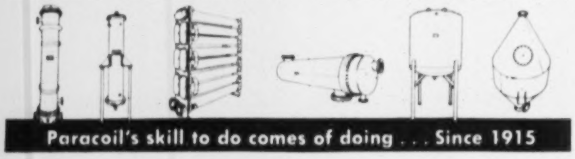

Paracoil's skill to do comes of doing . . . Since 1915

WE HEAR THAT

Continued

▶ *STRAUS-FRANK CO.* reports that its rolling display of *WORTHINGTON CORP.* packaged air conditioning equipment is beginning to show results in sizable orders. The 45 ft tractor trailer, "Operation Roadshow," was put underway in August and carries the entire Worthington packaged equipment display in the Texas area.

▶ Construction has been started at Dallas for a modern air conditioned office building to house *CARRIER CORP.'s* district headquarters for its Machinery and Systems and Unitary Equipment Divs. The single level structure incorporating 11,000 sq ft of office space will also provide 9000 sq ft of area for light assembly work and storage. Completion is scheduled for next Spring.

▶ Two additions totalling 90,800 sq ft are being built at *TRANE CO.'s* LaCrosse, Wis. plant, and another 30,000 sq ft is under construction at the company's Scranton, Pa. plant. Scheduled for completion during the first half of 1956, the additions will bring the company's production area to approximately a million sq ft.

▶ *FISHER GOVERNOR CO.* has moved into its recently completed research and engineering center. The new three story brick structure has 100,000 sq ft of space and is completely air conditioned.

▶ Sales offices for *WOLVERINE TUBE*, a division of *CALUMET & HELCA, INC.*, have moved from Detroit to Louisville, Ky. Located in Suite 128, Iroquois Plaza, 5330 S. Third St., the new office will be headquarters for sales representative *JACK SHEEHAN*.

▶ *MARVEL ENGINEERING CO.* has moved into its recently completed one story plant at 7227 N. Hamlin Ave., Chicago 45.

▶ *DE LAVAL TURBINE PACIFIC CO.* recently held open house at its new sales and service center in Millbrae, Calif.

▶ *McQUAY, INC.* has formally opened its new plant at Grenada, Miss. The cornerstone unveiling ceremony took place early in October.

▶ *OTTO BERNZ CO., INC.* has moved into a unit of its new plant in Rochester, N. Y. Several more units are planned.

▶ *CONNOR ENGINEERING CORP.*, Danbury, Conn., has opened a district office in Los Angeles.

Why REZNOR sells 1 out of every 2 Gas Unit Heaters

Reznor leads in QUALITY

One out of every 2 ! Such complete domination of a market shared by more than 50 producers can't be an accident. Reznor achieved this leadership by building a better unit heater. An alert, aggressive product development program keeps Reznor ahead of the field. And the highest standards of craftsmanship and materials insure to every Reznor user the full advantages of Reznor's "years-ahead" engineering.

Reznor offers the best PRICE

The best heater at the lowest price? No, it isn't possible. Prices on Reznor heaters are comparable to those of the best competitive units . . . higher than those of some inferior units. But the economies of mass production enable Reznor to build a better heater for the price. Wise buyers take advantage of this to get more heater value, dollar for dollar, from Reznor than any other manufacturer can afford to offer.

Reznor is first in KNOW-HOW

Gas unit heaters are a specialty, not just a side line, with Reznor. Every emphasis is given to the development of more efficient gas-fired heaters for business and industry. This determination to do one thing well means that every possible improvement will be fully explored and exploited — never sidetracked for other projects or products.

And because Reznor sells more, many more, gas unit heaters than any other manufacturer, Reznor knows more about gas unit heating. If your Reznor representative or distributor doesn't have the answer you need, he can get it. Somebody somewhere in the Reznor organization will have the solution — proved by experience.

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Reznor has distributors in more than 300 cities. Most of them maintain complete warehouse stocks. Wherever you are, you can be sure that the Reznor units you need will be available when and where you need them.

And wherever you are, if it's information you need, your Reznor distributor is as close as your telephone — usually for the price of a local call. If you don't find a Reznor listing under "Heaters-unit" in the classified pages of your telephone directory, please let us know. We'll give you the name and address of your nearest representative and distributor.

REZNOR
THE WORLD'S LARGEST-SELLING GAS UNIT **HEATERS**

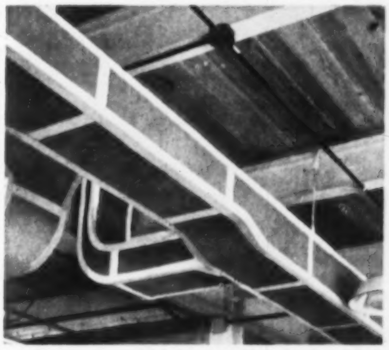
Reznor Manufacturing Company **51 Union St., Mercer, Pa.**

COSTS MORE and WORTH IT!

Grant Wilson

DUX-SULATION

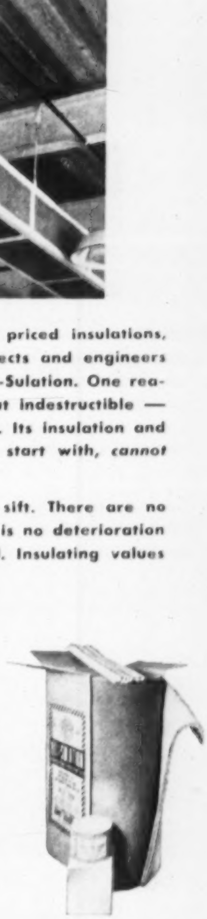
ASBESTOS PROTECTED



Despite the advent of many lower priced insulations, many of the nation's leading architects and engineers continue to specify Grant Wilson Dux-Sulation. One reason is that Dux-Sulation is just about indestructible — can't possibly be crushed or cracked. Its insulation and sound absorption efficiency, high to start with, *cannot* be impaired during installation.

Dux-Sulation can't powder, shift or sift. There are no "thin" spots, even at corners. There is no deterioration of any kind, no change of any kind. Insulating values are constant, indefinitely!

Special adhesive and tape (supplied) obviate the need for any additional "fasteners". If desired, Dux-Sulation can be applied in the shop and still withstand all necessary handling. On all counts, especially on projects where nothing less than the best is acceptable, Dux-Sulation is still your logical choice — the insulation you can specify with *absolute confidence* . . . no ifs, ands or buts!



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ASBESTOS and INSULATING MATERIALS
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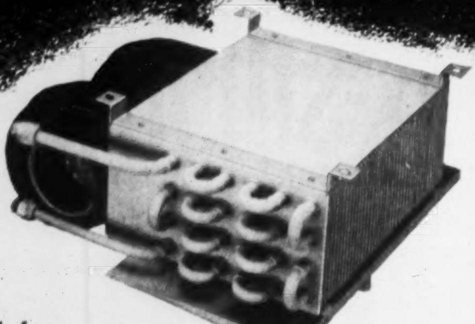

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Complete facilities for fabrication of pipe coils—all types—all materials. Engineering service. Send details for price.

MEETINGS & CONVENTIONS

JAN. 10-11—Yankee Instrument Fair & Symposium. Sherry Biltmore Hotel, Boston. Sponsored by Instrument Society of America—Boston Section, Inc., Box 282, Boston 1.

JAN. 16-18—Compressed Air and Gas Institute. Grand Hotel, Point Clear, Ala. Headquarters office: 1410 Terminal Tower, Cleveland 13.

JAN. 23-25—American Society of Heating and Air-Conditioning Engineers, Inc., annual meeting. Sheraton-Gibson Hotel, Cincinnati. ASHAE headquarters: 62 Worth St., New York 13.

JAN. 23-26—Seventh National Plant Maintenance & Engineering Show. Convention Hall, Philadelphia. Management: Clapp & Poliak, Inc., 341 Madison Ave., New York 17.

FEB. 1-2—Second Annual Midwest Welding Conference. Armour Research Foundation of Illinois Institute of Technology, Chicago. Armour Research is at 35 W. 33rd St., Chicago 16.

FEB. 6-9—Fifth Annual Industrial Ventilation Conference. Kellogg Center, Michigan State University,

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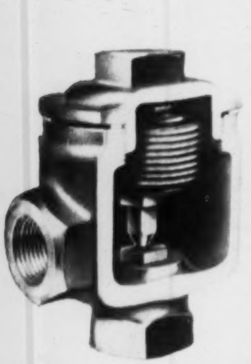
THERMOSTATIC TRAPS
. . . MAXIMUM CAPACITY WITH
MINIMUM MAINTENANCE!

That's the whole story on STERLING traps, and it's the best one yet to adequately describe the importance of the proper trap to good, efficient steam processing.

STERLING traps are made of bronze in ½" and ¾" size, for pressures from 0# to 200#, and with a full effective area of a large orifice for air removal. *Minimum* maintenance is a built-in feature on STERLING Traps, but should it be necessary the bellows is easily removed with a conventional ⅝" hex wrench . . . . no special spanner is needed!

It will pay well to investigate this superior trap more thoroughly and we will gladly send more information on request.



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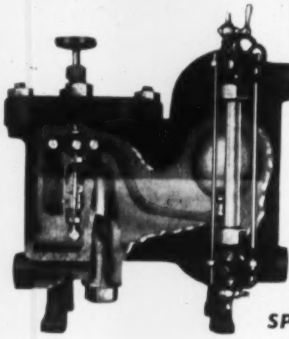

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Stainless Steel Valves and Reversible seats. Gauge glass assembly manual By-pass. Interior removable without breaking pipe line. Permanent water seal prevents steam leaks. No air binding. No dirt clogging.

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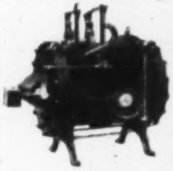
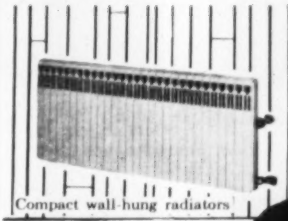
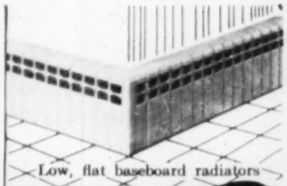
A simple but effective method for handling hot returns at any temperature. Noiseless operation. May be had with receivers.



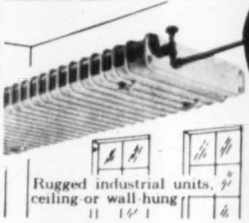
We also manufacture Templeton Brothers Lift Trap in a complete range of sizes and pressures.



Compact wall-hung radiators



Low, flat baseboard radiators



Rugged industrial units, ceiling or wall-hung

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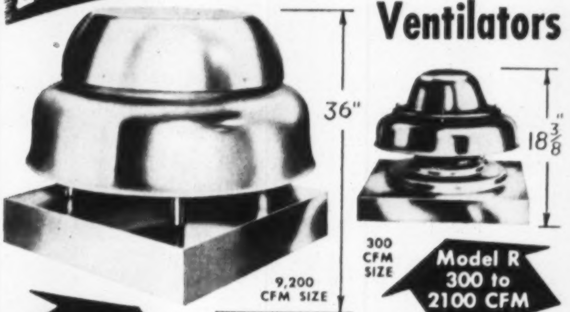

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300 to 2100 CFM

Model BV
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- **Lightweight**
- **Spun Aluminum**
- **Rubber Mounting**
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- **Non-overloading Blower Wheel (Aluminum)**

AVAILABLE IN LOW RPM

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COOK VENTILATORS
LOREN COOK COMPANY
Berea, Ohio

These models will be shown in the 1956 SWEET'S FILE

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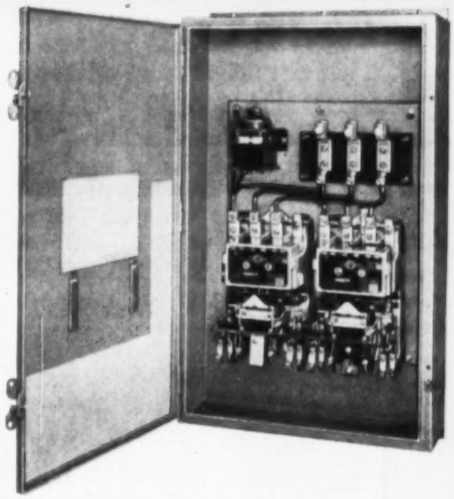
do the best job for AIR CONDITIONING



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*Major savings with in-between sizes

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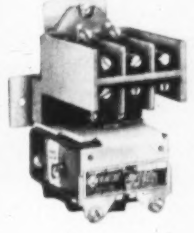

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FEB. 7-9—*11th Annual SPI Reinforced Plastics Division Conference.* Chalfonte-Haddon Hall, Atlantic City. Society of the Plastics Industry, Inc., 67 W. 44th St., New York 36.

FEB. 15-17—*Seventh Annual Corrosion Short Course for Pipeliners.* Mayo Hotel, Tulsa, Okla. Sponsored by Tulsa section, National Association of Corrosion Engineers. General chairman: James C. Bell, 119 W. Eighth St., Tulsa.

MARCH 12-16—*12th Annual Corrosion Conference.* Hotel Statler, New York. Sponsored by National Association of Corrosion Engineers, 1061 M & M Bldg., Houston 2.

MARCH 18-21—*American Society of Mechanical Engineers*, spring meeting. Multnomah Hotel, Portland, Ore. ASME headquarters: 29 W. 39th St., New York.

MARCH 21-23—*18th Annual American Power Conference.* Hotel Sherman, Chicago. Sponsored by Illinois Institute of Technology, 35 W. 33rd St., Chicago.

MAY 7-9—*Air Conditioning and Refrigeration Institute*, annual meeting. The Homestead, Hot Springs, Va. ACRI headquarters: 1346 Connecticut Ave., N.W., Washington 6, D.C.

JUNE 3-6—*American Society of Refrigerating Engineers*, Summer annual meeting. Cincinnati. ASRE headquarters: 234 Fifth Ave., New York 1.

JUNE 4-7—*National District Heating Association*, 47th annual meeting. Inn and Lodge, Williamsburg, Va. John F. Collins, Jr., secretary-treasurer, NDHA, 827 N. Euclid Ave., Pittsburgh.

JUNE 11-15—*21st National Oil-Heat Show.* Coliseum, New York. Managing director: R.H.L.Becker, Oil-Heat Institute of America, Inc., 500 Fifth Ave., New York 36.

JUNE 11-15—*Seventh National Plastics Exposition.* Coliseum, New York. Society of the Plastics Industry, Inc., 67 W. 44th St., New York 36.

JUNE 17-21—*American Society of Mechanical Engineers*, semi-annual meeting. Statler Hotel, Cleveland. Headquarters: 29 W. 39th St., New York 18.

JUNE 18-20—*American Society of Heating and Air-Conditioning Engineers, Inc.*, semi-annual meet-

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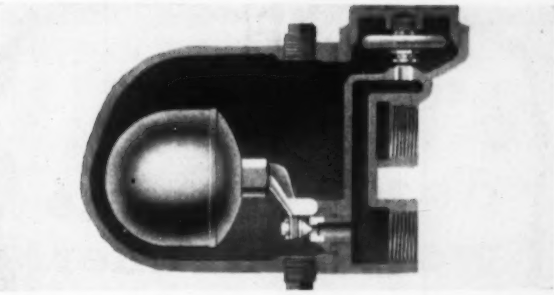

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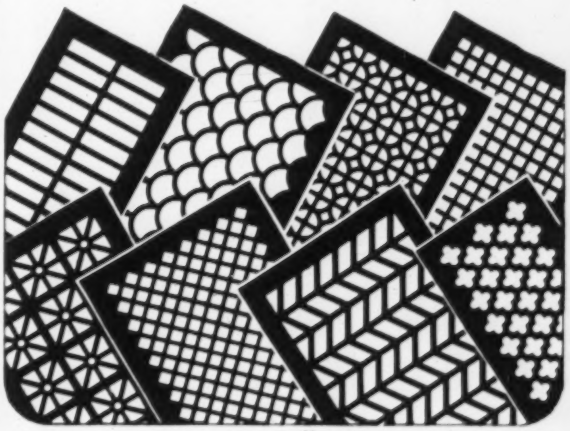

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MEETINGS & CONVENTIONS

Continued

ing. Shoreham Hotel, Washington, D.C. ASHAE headquarters: 62 Worth St., New York 13.

SEPT. 17-21—*11th Annual Instrument-Automation Conference and Exhibit.* Coliseum, New York. Sponsored by Instrument Society of America. Exhibit office: 3443 S. Hill St., Los Angeles 7.

NOV. 25-28—*American Society of Refrigerating Engineers,* semi-annual meeting. Boston. Information: ASRE, 234 Fifth Ave., New York 1.

NOV. 27-30—*Ninth National Chemical Exposition.* Public Auditorium, Cleveland. Chicago Section of the American Chemical Society, 86 E. Randolph St., Chicago 1.

FEB. 25-*MAR.* 1, 1957—*International Heating & Air-Conditioning Exposition.* International Ampitheater, Chicago. Under auspices of the American Society of Heating and Air-Conditioning Engineers. Management: International Exposition Co., 480 Lexington Ave., New York 17. +

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There's a G&O Finned Tube For Every Heating & Cooling Need

Users Have Named
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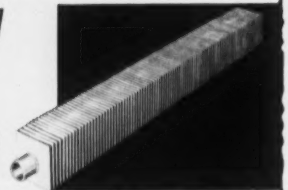

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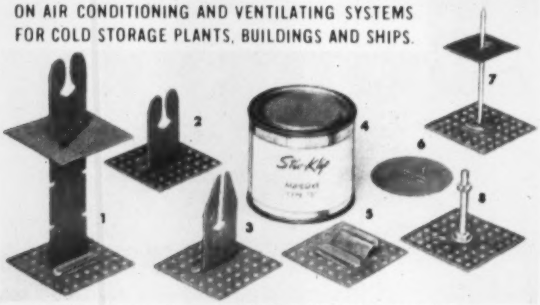

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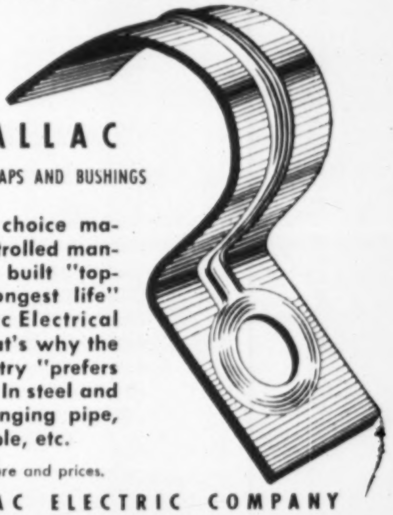

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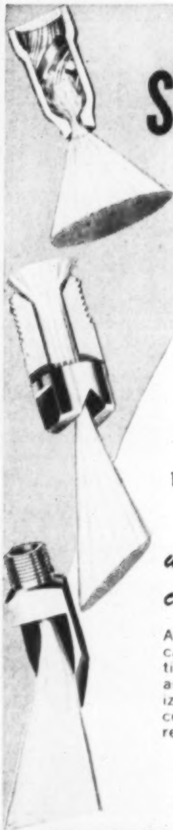

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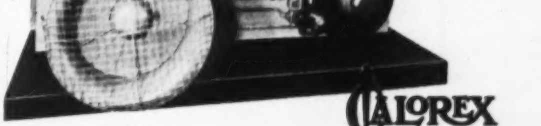
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1955 Book of ASTM Standards: Part I—Ferrous Metals—1834 pp. American Society for Testing Materials, 1916 Race St., Philadelphia 3. $13.50.

Design of Heating and Ventilating Systems—By F. W. Hutchinson. 320 pp. The Industrial Press, 93 Worth St., New York 13. $7.00.

Pape-Swift Boiler Reference Book, Vol. 2—900 pp. Contains specifications, drawings, information on recently manufactured boilers, as well as those dating back to 1890. Color-Art Printing & Stationery Co., 201 S. Kirkwood Rd., Kirkwood 22, Mo. $19.50.

Architectural Engineering—500 pp. Section covers environmental control, detailing panel heating, air conditioning, new devices and systems, thermal insulation and condensation. Dodge Books, 119 W. 40th St., New York 18. $11.50.

Piping Stress Calculations Simplified—By S. W. Spielvogel. Revised edition to conform to requirements of 1955 Code for Pressure Piping. S. W. Spielvogel, 15 Old Field Lane, Lake Success, N. Y. $5.00.

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Ritter Floor & Ceiling Plates are solidly constructed, well designed, and superbly finished. Ritter plates meet City, State & Federal Specifications. We stock all sizes and styles, split or solid; in plain, Nickel or Chrome Plated finish from 1/4" to 12" pipe size. Any special sizes, heights or shapes can be furnished.

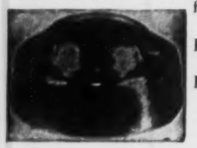
Ritter plates have been furnished for: V A Hospitals, Schools, Housing Projects, Terminals, Office Buildings and the United Nations.

Other "Ritter" Products — Tunnel Stanchions, Pipe Rolls, Cast Iron Screwed Flanges and other Piping Specialties.

Write For Circulars

RITTER PATTERN & CASTING CO., INC.
120 WALKER STREET, NEW YORK, N. Y.

No. 3A
Made split or solid
Clears sleeve 1/4" high



No. 36A
Made split or solid
Clears sleeve 1" high

No. 7
Made in two halves. Held by two screws. All dimensions to specifications.

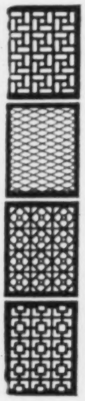
PIPE WELDING CLAMPS THAT MAKE WELDING PAY

Pipe clamps
Flange Clamps
Elbow Clamps
Angle Clamps
Pipe Markers

TWO SIZES
1/2 to 8 in. 8 to 16 in.
Light—Adjustable—Fast

The Jewel System of Pipe and Fitting Erection Ready for the Weld Keeps the Welder Welding Instead of Waiting
CUTS ERECTION COSTS
Modernize Your Own Methods and Tool Equipment

JEWEL MANUFACTURING COMPANY
1841 University Ave., St. Paul, Minn.

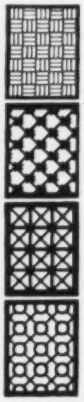


DIAMOND GRILLES
TRADE MARK

Look Better — Last Longer

Superior workmanship and finish in heavy-gauge metal assures installations of lasting beauty. Most designs stamped in any thickness, up to one-fourth inch, from any metal. Catalog No. 36 illustrates all designs and gives complete working data. Free on request.

Diamond Manufacturing Co.
Box 34 Wyoming, Pa.
Sales representatives in all principal cities



WATER FILTERS

All of the outstanding qualities that have made MARVEL SYNCLINAL FILTERS the overwhelming choice in the filtration of hydraulic oils and other oil base liquids have been adapted to provide the same efficiency in the filtration of water.

Balanced Synclinal Design means longer periods of efficient filtration and productive operation.

STURDY CONSTRUCTION

to withstand use under rugged conditions, yet simple enough to allow any workman to easily disassemble, clean and reassemble on the spot, in a matter of minutes.

A SIZE FOR EVERY NEED

Available in line and sump type units in capacities from 5 to 100 G.P.M. Permanent type Monel metal insert ranging in mesh sizes from coarse 30 to fine 200.

Complete data and further information are contained in WATER CATALOG #300.

Write for your copy

LINE TYPE (Cutaway)
IMMEDIATE DELIVERY!

Marvel not only delivers a top grade filter in both quality and performance, but DELIVERS IMMEDIATELY. If desired, shipments are made on same day orders are received.

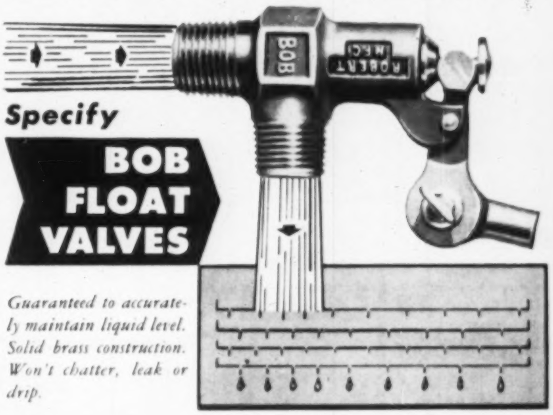
SUMP TYPE (Cutaway)

MARVEL Engineering Company

7227 N. Hamlin Ave., Chicago 45, Ill.
PHONE: JUniper 8-6023

The Standard Valve
For COOLING TOWER applications . . .

Specify
BOB FLOAT VALVES



Guaranteed to accurately maintain liquid level. Solid brass construction. Won't chatter, leak or drip.

Standard equipment for Major COOLING TOWER manufacturers and piping fabricators for POSITIVE-ACTION and unsurpassed performance under the toughest service conditions. Take advantage of the savings thru standardization *—one source for completeness of line—smaller and more flexible inventory—preventive maintenance—safety—durability—interchangeability—increase of sales—customer satisfaction and* ECONOMY.

Competitively priced and available in sizes from ⅜" to 1½". Write for details of complete line.

ROBERT Manufacturing Company
9035 Venice Boulevard, Los Angeles 34, California

YOUR KEY

TO FAST, EFFICIENT PIPE JOINT SEALING

KEY-TITE®

PIPE JOINT COMPOUND

for lines carrying water, gas, low-pressure steam. Seals joints *positively*, yet breaks easily, does not freeze in the joints.

ORDER NOW
FROM YOUR
LOCAL
SUPPLY HOUSE

or write for free sample

Seals Tight . . .
Breaks Right!

A PRODUCT OF KEY COMPANY
A DIVISION OF O.C.F. INDUSTRIES
INCORPORATED

KEY-TITE
WATER PROOF
PIPE JOINT
COMPOUND

2617 McCasland • East St. Louis, Illinois

DY-NAMIC BALANCING
"takes ALL the GUESS out of the balancing operation"

says V. Holstrom, Plant Supt. of the Day Co., Minneapolis, Minn., makers of dust control systems, where this "Bear" Dy-Namic Balancing Machine is being used to balance giant fan wheels.

SIMPLIFIED OPERATION of "Bear" Dy-Namic Balancing Machines is so fast, so economical, so easy to learn that manufacturers, maintenance shops and others are employing this revolutionary method with top-production results. No complicated manipulations to learn! Average shop man can learn to balance in a few hours! Get full details by sending for **FREE DY-NAMIC BALANCING MANUAL** . . . tells how you can eliminate noise and vibration, reduce wear and improve performance of rotating parts, *quickly, accurately*, and *economically*. Write: Bear Mfg. Co., Dept. H-16, Rock Island, Ill.

6040

"BEAR"
STATIC AND DY-NAMIC BALANCING MACHINES
balance rotating parts weighing from 4 oz. to 8 tons

NEW BOOKS & REPORTS

Continued

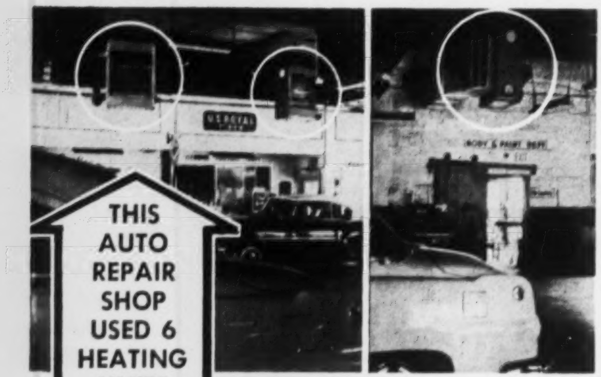
The "Approach Method" in Training for Ingenuity—From a lecture delivered at the Management Center, Marquette University, by Zuce Kogan. 16pp. Creative Thinking Institute, 738 Sheridan Rd., Chicago 13.

Hygienic Guides—Guides available for acetaldehyde, cadmium, carbon tetrachloride, butyl alcohol (N-butanol), amyl acetate. American Industrial Hygiene Association, 14125 Prevost, Detroit 27. 25c each.

A List of Gas Equipment for Industrial Uses—1955 Ed. Gas Appliance Manufacturers Association, 60 E. 42nd St., New York 17. $1.00.

Wet Cold I, Effects of Moisture on Transfer of Heat Through Insulating Materials. 24 pp. Order PB 111639, Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C. 75c.

Clay Pipe Warm Air Heating Duct Manual—12 pp. Clay Sewer Pipe Association, 311 High-Long Bldg., Columbus 15, O. Free. ‡



THIS AUTO REPAIR SHOP USED 6 HEATING UNITS . . . until 3 *Delta* OIL UNIT HEATERS *took over!*

PROBLEM: The 6 old-fashioned heaters in this Pontiac agency and repair shop were expensive to operate and required costly repairs quite often.

SOLUTION: 3 Delta oil-fired unit heaters replaced them. Installation was easy and cost surprisingly little because they required no boilers, pipes, fittings, valves, etc. They're factory wired and completely assembled . . . all ready to hang up.

RESULTS: The building was comfortable throughout the winter; no maintenance was required and operating costs were reduced 60%.

Send for complete new catalog !!

This is only one of hundreds of jobs that a Delta OIL Unit Heater can do better and more economically.

DELTA HEATING CORPORATION
TRENTON 8, NEW JERSEY

Extremely Low Silhouette Design

. . . the NEW LO-BOY MODEL

CENTRIFUGAL ROOF EXHAUSTERS

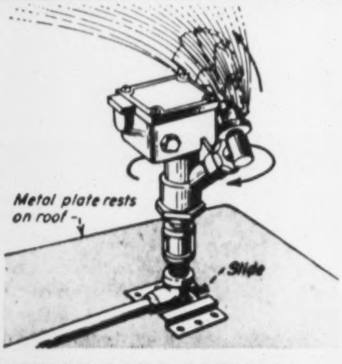
- **Quality**
- **Beauty**
- **Proven Performance**

Sizes 10" to 72"
600 — 47,000 CFM

AirMpeler

Motor mounting on side of support structure . . . out of line of air stream reduces height of the LO-BOY model nearly 50 per cent of older models. Low wind resistance. Adds to skyline beauty of your buildings. You'll be proud of the new LO-BOY.

Write for Lo-Boy Bul. **C. L. Ammerman Co.** **110 N. 2 St.** **Minneapolis, Minn.** Pats. Pend.



Metal plate rests on roof
Slide

COOL any building from the **ROOF**

effectively
efficiently
economically

RUPPRIGHT'S ROTARY ROOF COOLER
Box 6795 **Los Angeles 22, Cal.**

IDENTIFICATION NAME PLATES

for electrical controls, etc.

Machine engraved on black anodized hard aluminum alloy, or on plastic.
Also valve tags.
Quick service by mail.

Send for free samples and prices.

G. F. BUNNELL CO.
34 Ocean Ave. **Amityville, N. Y.**

NOW! YOU CAN FIND THAT LEAK IN MULTI-ROW COILS WITH THE ELVEE COIL CLEARER and TESTER

Locating the leak is easy. Clogged tubes are no problem. A safe and clean method for testing coils on the job. No need to replace Multi-Row Coils or remove to factory for repairs. Operate equipment until convenient to repair.

ELVEE COMPANY

Box 237 Melrose 76, Mass.

FLANDERS MILL INC. **"AIRPURE" FILTERS**

For Removal of Radioactive Dusts

Manufacturers of Air Filters of integrity. Specifications: 99.95% efficiency on particle sizes of 0.3 micron as measured by dioctyl-phthalate smoke machine.

The basis of filter efficiency is the accuracy of the test equipment. Our test machine is periodically compared with government equipment.

No filter leaves our plant without passing these rigid specifications.

FLANDERS MILL INC.

RIVERHEAD, NEW YORK

Classified Advertising

Rates for classified advertising are 15 cents for each word, including heading and address. One inch $7.00. Count nine words for keyed address. Minimum $2.50. Closing date 10th of the month preceding publication.

agents wanted . . .

Manufacturer's Agent required by well known manufacturer of STEAM, GAS AND OIL FIRED UNIT HEATERS, HEATING AND VENTILATING UNITS, CONVECTOR RADIATORS. Territories open in several sections of the United States. Airtherm Manufacturing Company, 711 South Spring Avenue, St. Louis 10, Missouri.

lines wanted . . .

Manufacturers Agent, ME, Contacting commercial, industrial insulation contractors and sheet metal contractors in states of Texas, Oklahoma, Louisiana, Arkansas, desires additional quality lines. Address Key 1202A, Heating, Piping & Air Conditioning, 6 North Michigan Ave., Chicago 2, Illinois.

for sale . . .

FOR SALE — Well established small plumbing and heating supply house located in Kentucky and doing a nice business. Owner has factory representative lines which conflict — reason for selling. Can be bought for $75,000.00 not including buildings which can be purchased for an additional $20,000.00. For particulars address Key 1205A, Heating, Piping & Air Conditioning, 6 North Michigan Avenue, Chicago 2, Ill.

Two 60 Ton Chrysler Airtemp Water Chillers complete. May be inspected. Write or call The Barr Rubber Products Company, 1531 First Street, Sandusky, Ohio.

miscellaneous . . .

NAMEPLATES—SPECIALLY manufactured for air conditioning and refrigeration requirements. Use these low cost 2½" x ¾" metal nameplates for labeling and identifying your installations. Over 100 standard refrigeration and air conditioning wordings available for immediate shipment. No minimum order required. Free samples, quotations. Catalog available covering metal or engraved bakelite nameplates worded as you specify. Numbered valve tag information included. SETON NAMEPLATE CO., Dept. HP-3, 394 Central Ave., New Haven 15, Conn.

patents . . .

INVENTION RECORD and Patent Information Booklet free on request. Franklin W. Durgin, Registered Patent Agent, c/o Evergreen Farm, 12500 Meadowood Drive, Silver Spring, Maryland.

situations open . . .

MECHANICAL ENGINEERS AND DRAFTSMEN

For permanent position in established consulting engineer-architect office. Heating, ventilating, and piping design experience related to industrial and commercial buildings.

Send complete resume of experience to

SAMBORN, STEKETEE & ASSOCIATES
1214 CHERRY STREET
TOLEDO 4, OHIO

AIR CONDITIONING man experenced in calculating and estimating year-round air conditioning for a large national plumbing and heating concern located in Columbus, Ohio. State experience and all particulars. Good salary and opportunity. Address Key 1204A, Heating, Piping & Air Conditioning, 6 North Michigan Avenue, Chicago 2, Ill.

OPPORTUNITY IN THE SOUTHWEST

for man experienced in installing and operating both rotary and gun type oil burner systems. Knowledge of combustion controls and related equipment essential, knowledge of gas burners desirable. Responsibilities to include start-up of equipment, trouble-shooting on the job, and development of new equipment for nationally known manufacturer of combustion equipment. Moderate amount air travel required. Write stating experience, qualifications and salary desired, to Key 1207A, Heating, Piping & Air Conditioning, 6 North Michigan Avenue, Chicago 2, Illinois.

situation wanted . . .

EXPERIENCED ENGINEER B. S. Chemical Engineering, 20 yrs. industrial process work — supervision of design, development, estimating, construction, maintenance, operation. Specialist — Air Conditioning and related fields. Desires administrative or Consultant position. Age 42, married. Available immediately. Address Key 1203A, Heating, Piping & Air Conditioning, 6 North Michigan Avenue, Chicago 2, Ill.

situations open . . .

ASSISTANT SECRETARY, for national engineering society. Preferably engineering graduate, but not mandatory. Duties involve coordination of all membership promotion, section formation, and section programs in all phases. Aptitude, and genuine interest in society work a requisite. Some traveling involved, with headquarters in New York City. Address Key 1206A, Heating, Piping & Air Conditioning, 6 North Michigan Ave., Chicago 2, Illinois.

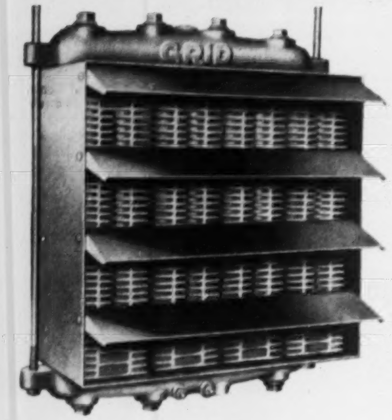
MECHANICAL ENGINEER — Preferably with heating and ventilation and/or steam power experience for work with engineering firm serving the Northwest. Pleasant offices in medium sized college town. Work to include studies, design and general supervision of construction. Give details of experience and salary requirements in letter to Cornell, Howland, Hayes and Merryfield, 1600 Western Avenue, Corvallis, Oregon.

She still needs
YOUR HELP
Join the
MARCH OF DIMES
January 3 to 31

GRID

UNIT HEATERS and BLAST HEATERS

hang 'em ... and forget 'em



26 years of service without repairs or other maintenance . . . that's the record of GRID Unit Heaters. Only a GRID installation can provide that low cost service record. Here's why

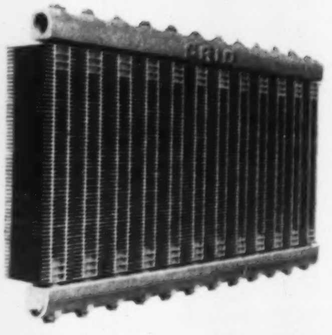
GRID is an all cast unit with finned heating sections and headers tested to withstand steam pressures up to 250# P.S.I.

GRID construction uses no brazed, soldered, rolled or welded connections between condenser and headers. A specially designed threaded nipple assures a precision, leak-proof fit.

GRID construction has all similar metals in contact with steam, thus preventing electrolytic corrosion which eventually occurs in copper type unit heaters where steam passes from iron pipes into copper cores. (Write for booklet CORROSION IN UNIT HEATERS.)

GRID construction resists corrosion from fumes present in most types of industry.

GRID design incorporating low outlet temperatures, proper fan sizes and motor speeds, assures delivery of warm comfortable air in ample volume to the working level. No stratification of warm air at the ceiling to waste your fuel dollars.

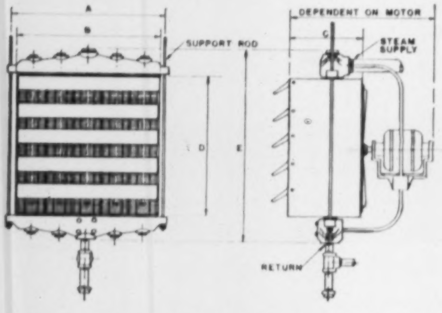


GRID Blast sections have the same high efficiency and lasting qualities as GRID Unit Heaters . . . no tortuous air passages . . . complete absence of rupture, strain and warping . . . guaranteed for steam pressures up to 250 lbs.

Hundreds of manufacturers are saving thousands of dollars in fuel and maintenance costs because theirs is a GRID installation. They find that they can "hang 'em and forget 'em" . . . no other unit heater has its lasting qualities.

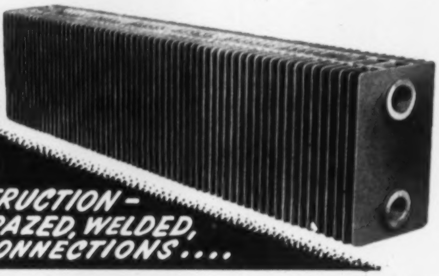
GRID UNIT HEATERS HUNG IN 1929 ARE STILL OPERATING TODAY....

- *LARGER AIR VOLUME*
- *LOW MAINTENANCE EXPENSE*
- *MORE AIR CHANGES PER HOUR*
- *LONG LIFE*



Overall dimensions for installation of Cast Iron GRID Unit Heater

CAST IRON HEATING SECTIONS



ONE PIECE CONSTRUCTION — NO SOLDERED, BRAZED, WELDED, OR EXPANDED CONNECTIONS....

CI (CAST IRON) SERIES GRID UNIT HEATER DATA

Model No.	Dimensions A	B	C	D	E	Motor HP	RPM	Vol. Fan CFM	Capacities 5 PSI Steam 60°F Air Btu/Hr.	Final Temp. °F	Pipe Size Supply	Return	Support Rod Dia.	Approx. Ship. Weight Lbs.
CI-1000	11 5/8	10 1/2	12 1/4	10 7/16	17 1/4	1/20	1550	572	29,080	106	1 1/4	1 1/4	1/2	150
CI-1200	14 1/8	13 1/8	12 1/4	13 9/16	21 1/2	1/12	1700	798	45,450	112	1 1/4	1 1/4	1/2	210
CI-1500	17 1/2	15 3/8	11 1/2	16	23 7/8	1/8	1750	1500	76,500	107	1 1/2	1 1/2	1/2	280
CI-1520	17 1/2	15 3/8	11 1/2	21	28 3/8	1/8	1750	1700	101,500	114	1 1/2	1 1/2	1/2	390
CI-2000	22 1/8	20 9/16	11 7/8	21 1/16	28 3/8	1/6	1150	2600	143,000	110	2	1 1/2	1/2	490
CI-2025	22 1/8	20 9/16	11 7/8	25 7/8	35 1/4	1/6	1150	2875	173,640	115	2	1 1/2	1/2	520
CI-2500	27 1/2	25 7/8	13	25 7/8	35 1/4	1/2	1150	4350	224,000	107	2	1 1/2	5/8	700
CI-2504	27 1/2	25 7/8	13	25 7/8	35 1/4	1/4	1150	3300	206,000	117	2	1 1/2	5/8	660
CI-2530	27 1/2	25 7/8	13	31	40 1/2	1/2	1150	4650	275,800	114	2	1 1/2	5/8	900
CI-3000	32 5/8	31	13	31	40 1/2	1/2	850	6300	332,000	108	2 1/2	1 1/2	3/4	1020
CI-3000	32 5/8	31	13	31	40 1/2	1 1/2	1150	8000	380,000	103	2 1/2	1 1/2	3/4	1070

OFFICES IN PRINCIPAL CITIES

D. J. MURRAY MANUFACTURING CO.

WAUSAU, WISCONSIN

T.M. REG. U.S. PAT. OFF.

Write for complete catalog information on GRID Unit Heaters, GRID Blast Heaters, and GRID Radiation.

SECTION OF JANUARY 1956 HEATING, PIPING & AIR CONDITIONING

1956 DIRECTORY

Heating, Piping and Air Conditioning Equipment for Industrial, Commercial, Institutional and Public Buildings

PART 1—Products Advertised In This Issue—Page 2d

For the names of the manufacturers of products advertised in this issue, look in Part 1, where the advertised products are classified in "directory style" with the noun governing. For the page on which you will find the advertising of manufacturers in this issue, see the last two pages of this yellow Directory Section.

PART 2—All Products Classified—Page 11d

If you want to know the names of one or more manufacturers making a certain product, look in Part 2, where all products are classified alphabetically in "directory style" with the noun governing (for instance, "unit heaters" are listed under "heaters, unit").

PART 3—All Trade Names—Page 105d

If you have the trade name of a product and want to know who manufactures it, look in Part 3, where trade names are alphabetically listed. Trade names the same as or identifiable from the company name are not listed. Manufacturers with such trade names can be easily identified under their product classifications in Parts 1 and 2.

PART 4—All Manufacturers' Addresses—Page 125d

For the complete name and address of any manufacturer, look in Part 4.

Heating, Piping & Air Conditioning
6 N. Michigan Ave.
Chicago 2, Illinois

DIRECTORY SECTION

HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRY AND LARGE BUILDINGS

PART 1—PRODUCTS ADVERTISED IN THIS ISSUE

The products classified in this Part 1 of the Directory Section are only those advertised in this issue. For the complete listings of these and other products made by all manufacturers, see Part 2, starting on page 11d. For the pages on which you will find the advertising of manufacturers in this issue, see the Index to Advertisers on the last two pages of this yellow Directory Section.

ABSORBERS, VIBRATION, FOR REFRIGERANT AND OTHER PIPE LINES

AMERICAN METAL HOSE DIV., THE AMERICAN BRASS CO.
FINN & COMPANY, INC., T. R.

ABSORBERS, SHOCK, LIQUID, TO ELIMINATE WATER HAMMER IN PIPING

JOSAM MFG. CO.

ADHESIVES, FOR INSULATION OTHER THAN PIPE

GRANT WILSON, INC.
MIRACLE ADHESIVES CORP.

ADHESIVES, FOR PIPE COVERING

MIRACLE ADHESIVES CORP.

AFTERCOOLERS, COMPRESSED AIR

DAVIS ENGINEERING CORP.

ANEMOMETERS

ILLINOIS TESTING LABORATORIES, INC.

BASES AND PADS, VIBRATION ISOLATING

FINN & COMPANY, INC., T. R.
KORFUND, INC.

BEARINGS, BALL

DODGE MFG. CORP.
SEALMASTER BEARINGS, DIV. OF STEPHENS-ADAMSON MFG. CO.

BEARINGS, PILLOW BLOCK

DODGE MFG. CORP.
LAU BLOWER CO.
RANDALL GRAPHITE BEARINGS, INC.
SEALMASTER BEARINGS, DIV. OF STEPHENS-ADAMSON MFG. CO.

BEARINGS, ROLLER

DODGE MFG. CORP.

BEARINGS, SLEEVE

DODGE MFG. CORP.
LAU BLOWER CO.
RANDALL GRAPHITE BEARINGS, INC.

BENDERS, PIPE

GREENLEE TOOL CO., DIV. OF GREENLEE BROS. & CO.

BENDERS, TUBING

GREENLEE TOOL CO., DIV. OF GREENLEE BROS. & CO.

BLADES, PROPELLER FAN

BRONSON FAN MFG. CORP.
KODY BLOWER CO.

BLOWERS, HIGH PRESSURE

BARRY BLOWER CO.
BUFFALO FORGE CO.
CLARAGE FAN CO.
GENERAL BLOWER CO.
INDUSTRIAL PLASTIC FABRICATORS, INC. (Plastic)
PEERLESS ELECTRIC CO.
WING MFG. CO., L. J.

BOARDS, PANEL AND CONTROL

WILL-BURT CO., THE

BOILERS, HEATING, CAST IRON, SECTIONAL

SMITH CO., INC., H. B., THE

BOILERS, HEATING, STEEL, FIRE TUBE

COMBUSTION ENGINEERING INC.
TITUSVILLE IRON WKS. CO., THE

BOILERS, HEATING, STEEL, WATER TUBE

COMBUSTION ENGINEERING INC.
RAYPAK CO., INC.
TITUSVILLE IRON WKS. CO., THE

BOILERS, PACKAGED UNITS, HEATING AND PROCESS — Including Controls, Feed Pump, etc.

BOILER ENGINEERING & SUPPLY CO.
COMBUSTION ENGINEERING INC.
ORR & SEMBOWER, INC.
PREFERRED UTILITIES MFG. CORP.
SUPERIOR COMBUSTION INDUSTRIES, INC.

BOOKS, TECHNICAL DATA

COLOR-ART PRINTING & STATIONERY CO.

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL

GORDON & PIATT, INC.
ZINK CO., JOHN

BURNERS, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL

BEST COMBUSTION EQUIPMENT CO., INC., W. N.
GORDON & PIATT, INC.
PREFERRED UTILITIES MFG. CORP.
RAY OIL BURNER CO.
WEBSTER ENGINEERING CO.

BURNERS, OIL, COMMERCIAL AND INDUSTRIAL

BEST COMBUSTION EQUIPMENT CO., INC., W. N.
PREFERRED UTILITIES MFG. CORP.

CABLE, ELECTRIC HEATING

PREFERRED UTILITIES MFG. CORP.

CAPS, VENT, FLUE

PENN VENTILATOR CO.

CEMENT AND COMPOUNDS, PIPE JOINT

KEY CO.

CHANGERS, SPEED MECHANICAL

PHILADELPHIA GEAR WORKS, INC.

CHILLERS, WATER, FOR AIR CONDITIONING AND REFRIGERATION

(Also see Compressors, Refrigerating)

ACME INDUSTRIES, INC.
BELL & GOSSETT CO.
DAVIS ENGINEERING CORP.
FRICK CO.
KENNARD CORP.
PATTERSON-KELLEY CO., INC.
VILTER MFG. CO., THE
WHITLOCK MFG. CO.

CIRCULATORS FOR HOT WATER HEATING SYSTEMS

BELL & GOSSETT CO.
CHICAGO PUMP CO., SUBSIDIARY OF FOOD MACHINERY & CHEMICAL CORP.
DUNHAM CO., C. A.

CLAMPS, BEAM, PIPE HANGING

CARPENTER & PATERSON, INC.

CLAMPS, PIPE, WELDING

JEWEL MFG. CO.

CLEANERS, AIR, ELECTRICAL

AIR-MAZE CORP.
DOLLINGER CORP.
TRION, INC.
WESTINGHOUSE ELECTRIC CORP., STURTEVANT DIV.

COAL

CHESAPEAKE & OHIO RAILWAY CO.

COATINGS, PROTECTIVE, FOR METALS

ARMSTRONG CORK CO.
MIRACLE ADHESIVES CORP.
NOVELTY STEAM BOILER WKS., INC.
TAPECOAT CO., THE

COILS AND PANELS, RADIANT HEATING AND COOLING, PREFABRICATED

BURGESS-MANNING CO., ARCHITECTURAL PRODUCTS DIV.
KRITZER RADIANT COILS, INC.

COILS, PIPE

CAPITOL MFG. & SUPPLY CO.
REMPE CO.
VILTER MFG. CO., THE

COLLECTORS, DUST

AMERICAN AIR FILTER CO., INC.

COMPRESSORS, REFRIGERATING, COMBINED WITH CONDENSER, WATER CHILLER, PIPING CONNECTIONS, AND CONTROLS

ACME INDUSTRIES, INC.
BELL & GOSSETT CO.
CURTIS MFG. CO., REFRIGERATION DIV.
CHRYSLER AIRTEMP, DIV. OF CHRYSLER CORP.
FRICK CO.
VILTER MFG. CO., THE
WORTHINGTON CORP.

COMPRESSORS, REFRIGERATING, CENTRIFUGAL

YORK CORP.

COMPRESSORS, REFRIGERATING, RECIPROCATING

FRICK CO.
VILTER MFG. CO., THE

CONDENSERS, REFRIGERATING, AIR COOLED

CURTIS MFG. CO., REFRIGERATION DIV.
HALSTEAD & MITCHELL
PEERLESS OF AMERICA, INC.
UNITED STATES AIR CONDITIONING CORP.
VILTER MFG. CO., THE

CONDENSERS, REFRIGERATING, EVAPORATIVE

ACME INDUSTRIES, INC.
BALTIMORE AIRCOIL CO., INC.
KENNARD CORP.
NIAGARA BLOWER CO.
REFRIGERATION ENGINEERING, INC.
VILTER MFG. CO., THE

CONDENSERS, REFRIGERATING, SHELL AND COIL

ACME INDUSTRIES, INC.
BELL & GOSSETT CO.
CURTIS MFG. CO., REFRIGERATION DIV.
DAVIS ENGINEERING CORP.
HALSTEAD & MITCHELL
PATTERSON-KELLEY CO., INC.
VILTER MFG. CO., THE

CONDENSERS, REFRIGERATING, SHELL AND TUBE

ACME INDUSTRIES, INC.
BELL & GOSSETT CO.
CURTIS MFG. CO., REFRIGERATION DIV.
DAVIS ENGINEERING CORP.
FRICK CO.
PATTERSON-KELLEY CO., INC.
VILTER MFG. CO., THE

CONDUIT, UNDERGROUND PIPING

DURANT INSULATED PIPE CO.
DURANT INTERNATIONAL CORP.
KAISER CO., E. B.
PORTER & CO., INC., H. W.
RIC-WIL, INC.
STILLWATER CONDUIT DIV.

CONNECTIONS, DUCT, FLEXIBLE (ASBESTOS, CANVAS, ETC.)

DURO-DYNE CORP.
ELGEN MFG. CO.
FLEXAUST CO.
FLEXIBLE TUBING CORP.
GRANT WILSON, INC.
WIREMOLD CO.

CONTROLS, FOR INDIRECT WATER HEATERS

GENERAL CONTROLS CO.
MERCOID CORP., THE

CONTROL SYSTEMS, PRE-ASSEMBLED AS UNITS, FOR HEATING, COOLING, AND VENTILATING

BARBER-COLMAN CO.
DUNHAM CO., C. A.

CONTROLLERS AND STARTERS, MOTOR

ALLEN-BRADLEY CO.
FURNAS ELECTRIC CO.

CONTROLS, DRAFT, BAROMETRIC

FIELD CONTROL DIV. OF H. D. CONKEY & CO.
PREFERRED UTILITIES MFG. CORP.
WALKER MFG. & SALES CO.

CONTROLS, FIRE PROTECTION, SPRINKLER SYSTEM

ALLEN MFG. CO., W. D.
GRINNELL CO., INC.

CONTROLS, FLAME FAILURE

MERCOID CORP., THE
WHEELCO INSTRUMENTS DIV., BARBER-COLMAN CO.

CONVERTORS, STEAM

DAVIS ENGINEERING CORP.
PATTERSON-KELLEY CO., INC.

COOLERS, OIL

DAVIS ENGINEERING CORP.

COOLERS, UNIT (SUSPENDED TYPE)

REMPE CO.

COUPLINGS, PIPE

CAPITOL MFG. & SUPPLY CO.
GRINNELL CO., INC.
GUSTIN-BACON MFG. CO.
LADISH CO.
WATSON-STILLMAN FITTINGS DIV., H. K. PORTER CO., INC.

CUT-OFFS, LOW WATER, HEATING BOILER

GENERAL CONTROLS CO.
MAID-O'MIST, INC.
McDONNELL & MILLER, INC.
MERCOID CORP., THE
WATTS REGULATOR CO.

CUTTERS, PIPE

REED MFG. CO.
RIDGE TOOL CO.

DAMPERS, DIFFUSER

ANEMOSTAT CORP. OF AMERICA

DAMPERS, DUCT, MANUALLY OPERATED

BARBER-COLMAN CO.
DURO-DYNE CORP.
TITUS MFG. CORP.

DAMPERS, DUCT, REMOTE CONTROLLED

AIR & REFRIGERATION CORP.
JOHNSON SERVICE CO.

DEHUMIDIFIERS, ABSORPTION AND ADSORPTION

SURFACE COMBUSTION CORP.

DEHUMIDIFIERS FOR COMPRESSED AIR

PRITCHARD & CO. OF CALIFORNIA, J. F.

DEHUMIDIFIERS, SPRAYED COIL

CLARAGE FAN CO.
KENNARD CORP.

DEHYDRATORS, REFRIGERANT

HENRY VALVE CO.

DIFFUSERS, AIR, BASEBOARD

INDEPENDENT REGISTER CO.

DIFFUSERS, AIR, CEILING

AIR DEVICES, INC.
ANEMOSTAT CORP. OF AMERICA
BARBER-COLMAN CO.
CONNOR ENGINEERING CORP.
INDEPENDENT REGISTER CO.
MULTI-VENT DIV., PYLE-NATIONAL CO., THE
UNIVERSAL DIFFUSER CORP.

DIFFUSERS, AIR, FLOOR

A-J MFG. CO.
AIR DEVICES, INC.
INDEPENDENT REGISTER CO.

DIFFUSERS, AIR, HIGH PRESSURE

ANEMOSTAT CORP. OF AMERICA
BARBER-COLMAN CO.
CONNOR ENGINEERING CORP.
UNIVERSAL DIFFUSER CORP.

DIFFUSERS, AIR, WALL

A-J MFG. CO.
AIR DEVICES, INC.
AIR-FACTORS, INC.
BARBER-COLMAN CO.
INDEPENDENT REGISTER CO.
TITUS MFG. CORP.
UNIVERSAL DIFFUSER CORP.

DRIVES, GEAR

PHILADELPHIA GEAR WORKS, INC.

DRYERS, INDUSTRIAL

AIR & REFRIGERATION CORP.

DUCTS AND DUCT FITTINGS, PREFABRICATED, FLEXIBLE, NON-METALLIC

FLEXAUST CO.
FLEXIBLE TUBING CORP.
WIREMOLD CO.

EJECTORS, SEWAGE

CHICAGO PUMP CO., SUBSIDIARY OF FOOD MACHINERY & CHEMICAL CORP.
WEIL PUMP CO.

ELBOWS, BALANCING, FOR HOT WATER HEATING SYSTEMS

SARCOTHERM CONTROLS, INC.

ELIMINATORS, AIR, FOR HEATING AND PIPING SYSTEMS

BELL & GOSSETT CO.
GORTON HEATING CORP.

HOFFMAN SPECIALTY MFG. CORP.
MARSH HEATING EQUIPMENT CO.
WEBSTER & CO., WARREN

EQUIPMENT, BALANCING

BEAR MFG. CO., INDUSTRIAL DIV.

EXCHANGERS, HEAT

ACME INDUSTRIES, INC.
BELL & GOSSETT CO.
DAVIS ENGINEERING CORP.
NOVELTY STEAM BOILER WKS., INC.
PATTERSON-KELLEY CO., INC.

FANS, AXIAL FLOW, PRESSURE TYPE

AMERICAN BLOWER CORP.
JOY MFG. CO.
KODY BLOWER CO.
SOUTH BEND AIR PRODUCTS, INC.
WING MFG. CO., L. J.

FANS, CENTRIFUGAL

ALADDIN HEATING CORP.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
AMERICAN BLOWER CORP.
BARRY BLOWER CO.
BISHOP & BABCOCK MFG. CO.
BRUNDAGE CO., THE
BUFFALO FORGE CO.
CHICAGO BLOWER CORP.
CLARAGE FAN CO.
GENERAL BLOWER CO.
INDUSTRIAL PLASTIC FABRICATORS, INC. (Plastic)
LAU BLOWER CO.
MORRISON PRODUCTS, INC.
NEW YORK BLOWER CO.
PEERLESS ELECTRIC CO.
UTILITY FAN CORP., DIV. OF UTILITY APPLIANCE CORP.

FANS, MATERIAL HANDLING

CLARAGE FAN CO.
PEERLESS ELECTRIC CO.

FANS, MECHANICAL DRAFT, FOR BOILERS

BUFFALO FORGE CO.
CLARAGE FAN CO.
KODY BLOWER CO.
QUICKDRAFT CO.
WING MFG. CO., L. J.

FANS, PROPELLER

AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
AMERICAN BLOWER CORP.
CLARAGE FAN CO.
KODY BLOWER CO.
LAU BLOWER CO.
NEW YORK BLOWER CO.
PEERLESS ELECTRIC CO.
SOUTH BEND AIR PRODUCTS, INC.

FASTENERS, POWDER OPERATED

RAMSET FASTENING SYSTEM, WINCHESTER-WESTERN DIV., OLIN MATHIESON CHEMICAL CORP.
REMINGTON ARMS CO., INC.

FASTENERS, INSULATION

MIRACLE ADHESIVES CORP.
RAMSET FASTENING SYSTEM, WINCHESTER-WESTERN DIV., OLIN MATHIESON CHEMICAL CORP.
REMINGTON ARMS CO., INC.
STIC-KLIP MFG. CO., INC.

FEEDERS, WATER, HEATING BOILER

McDONNELL & MILLER, INC.
WATTS REGULATOR CO.

FILTERS, AIR, AUTOMATIC

AIR-MAZE CORP.
AMERICAN AIR FILTER CO., INC.
CONTINENTAL AIR FILTERS, INC.
DOLLINGER CORP.

FILTERS, AIR, GREASE

AIR-MAZE CORP.
AMERICAN AIR FILTER CO., INC.
CONTINENTAL AIR FILTERS, INC.
DOLLINGER CORP.

FILTERS, AIR, UNIT, CLEANABLE

AIR DEVICES, INC.
AIR-MAZE CORP.
AMERICAN AIR FILTER CO., INC.
CAREY ELECTRONIC ENGINEERING CO., METAL WOOL DIV.
CONTINENTAL AIR FILTERS, INC.
DOLLINGER CORP.
EVANS CORP., THE, GEORGE
FARR COMPANY
PEDEN EQUIPMENT CO.

FILTERS, AIR, UNIT, RENEWABLE MEDIA

AMERICAN AIR FILTER CO., INC.
CAMBRIDGE FILTER CORP.
CONTINENTAL AIR FILTERS, INC.
DOLLINGER CORP.
PITTSBURGH PLATE GLASS CO.

FILTERS, AIR, UNIT, THROW-AWAY

AIR-MAZE CORP.
AMERICAN AIR FILTER CO., INC.
FLANDERS MILL, INC.
PITTSBURGH PLATE GLASS CO.

FILTERS, FOR OIL BURNERS

MARVEL ENGINEERING CO.

FILTERS, PIPE LINE

AIR-MAZE CORP.
DOLLINGER CORP.
MARVEL ENGINEERING CO.

FILTERS, REFRIGERANT

DOLLINGER CORP.

FILTERS, WATER

DOLLINGER CORP.
MARVEL ENGINEERING CO.

FITTINGS, COPPER TUBE, FLARED

NORTHERN INDIANA BRASS CO.

FITTINGS, COPPER TUBE, SOLDER

NORTHERN INDIANA BRASS CO.
WALWORTH CO. (Brazed)

FITTINGS, HOT WATER HEATING SYSTEM, ONE PIPE

BELL & GOSSETT CO.

FITTINGS, HOSE TO PIPE

ALLEN MFG. CO., W. D.

FITTINGS, LIFT

WEBSTER & CO., WARREN

FITTINGS, PIPE

CAPITOL MFG. & SUPPLY CO.
DURIRON CO., INC., THE
GRINNELL CO., INC.
LADISH CO.
McDONALD MFG. CO., A. Y.
MIDWEST PIPING CO., INC.
VILTER MFG. CO., THE
WALWORTH CO.
WATSON-STILLMAN FITTINGS DIV., H. K. PORTER CO., INC.

FITTINGS, PIPE, BRONZE, BRAZED

WALWORTH CO.

FITTINGS, PIPE, CAST IRON, FLANGED

DURIRON CO., INC., THE (Acid resisting)

FITTINGS, PIPE, WELDING

BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.
LADISH CO.
MIDWEST PIPING CO., INC.
TAYLOR FORGE & PIPE WKS.

FLANGES, PIPE

BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.
GRINNELL CO., INC.
LADISH CO.
RITTER PATTERN & CASTING CO., INC.
TAYLOR FORGE & PIPE WKS.
WALWORTH CO.

FURNACES, WARM AIR, FOR INDUSTRIAL AND LARGE BUILDING CENTRAL HEATING

CAMPBELL HEATING CO.
HAYES FURNACE MFG. & SUPPLY CO.
MAMMOTH FURNACE CO.

GAGES, INDICATING, PRESSURE

MERIAM INSTRUMENT CO., THE
TAYLOR INSTRUMENT COMPANIES

GAGES, INDICATING VACUUM

MERIAM INSTRUMENT CO., THE
TAYLOR INSTRUMENT COMPANIES

GAGES, LIQUID LEVEL

HENRY VALVE CO.
LIQUIDEPTH INDICATORS, INC.
MERIAM INSTRUMENT CO., THE
TAYLOR INSTRUMENT COMPANIES

GAGES, OIL TANK

LIQUIDEPTH INDICATORS, INC.

GRILLES

A-J MFG. CO.
AUER REGISTER CO.
BARBER-COLMAN CO.
DIAMOND MANUFACTURING CO.
GENERAL REGISTER CORP.
HENDRICK MFG. CO.
INDEPENDENT REGISTER CO.
REGISTER & GRILLE MFG. CO., INC.
STEWART MFG. CO., INC.
TITUS MFG. CORP.
WATERLOO REGISTER CO., INC.

HANGERS AND SUPPORTS, PIPE

CARPENTER & PATERSON, INC.

GRINNELL CO., INC.
MINERALLAC ELECTRIC CO.
RAMSET FASTENING SYSTEM, WINCHESTER-WESTERN DIV., OLIN MATHIESON CHEMICAL CORP.
REMINGTON ARMS CO., INC.
RITTER PATTERN & CASTING CO., INC.

HANGERS OR BRACKETS, RADIATOR

CARPENTER & PATERSON, INC.

HEADERS, PIPE, WELDED

TAYLOR FORGE & PIPE WKS.

HEATERS, AIR, DIRECT FIRED, COAL

CAMPBELL HEATING CO.

HEATERS, AIR, DIRECT FIRED, COMBINATION GAS AND OIL

AIRTHERM MFG. CO.
MAMMOTH FURNACE CO.
OLSON & CO., ARTHUR A.

HEATERS, AIR, DIRECT FIRED, GAS, CENTRIFUGAL FAN TYPE

AIRTHERM MFG. CO.
CAMPBELL HEATING CO.
DRAVO CORP., MACHINERY DIV.
HAYES FURNACE MFG. & SUPPLY CO.
OLSON & CO., ARTHUR A.
PRAT-DANIEL CORP.
REZNOR MFG. CO.
UNITED STATES AIR CONDITIONING CORP.
ZINK CO., JOHN

HEATERS, AIR, DIRECT FIRED, OIL, FLOOR TYPE

AIRTHERM MFG. CO.
CAMPBELL HEATING CO.
MAMMOTH FURNACE CO.
OLSON & CO., ARTHUR A.
PRAT-DANIEL CORP.

HEATERS, AIR, DIRECT FIRED, OIL, PORTABLE, FOR INDUSTRIAL SPACE HEATING

PRAT-DANIEL CORP.

HEATERS, AIR, DIRECT FIRED, OIL, SUSPENDED TYPE

DRAVO CORP., MACHINERY DIV.

HEATERS, DUCT, GAS

HAYES FURNACE MFG. & SUPPLY CO.

HEATERS, SUSPENDED, RADIANT, GAS FIRED

PRAT-DANIEL CORP.

HEATERS, UNIT, GAS, PROPELLER FAN TYPE

AIRTHERM MFG. CO.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
GRINNELL CO., INC.
MODINE MFG. CO.
NESBITT, INC., JOHN J.
REZNOR MFG. CO.
SURFACE COMBUSTION CORP.
WEBSTER & CO., WARREN

HEATERS, UNIT, OIL, PROPELLER FAN TYPE

DELTA HEATING CORP.

HEATERS, UNIT, STEAM AND HOT WATER, CABINET TYPE

AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
CLARAGE FAN CO.
DUNHAM CO., C. A.
NESBITT, INC., JOHN J.

HEATERS, UNIT, STEAM AND HOT WATER, CENTRIFUGAL FAN TYPE

AIRTHERM MFG. CO.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
CLARAGE FAN CO.
DUNHAM CO., C. A.
KENNARD CORP.
NESBITT, INC., JOHN J.
NEW YORK BLOWER CO.
WESTINGHOUSE ELECTRIC CORP., STURTEVANT DIV.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, HORIZONTAL BLOW

AIRTHERM MFG. CO.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
CARRIER CORP.
CLARAGE FAN CO.
DUNHAM CO., C. A.
GRINNELL CO., INC.
MODINE MFG. CO.
MURRAY MFG. CO., D. J.
NESBITT, INC., JOHN J.
WING MFG. CO., L. J.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, VERTICAL BLOW

AIRTHERM MFG. CO.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
CARRIER CORP.
CLARAGE FAN CO.
DUNHAM CO., C. A.
GRINNELL CO., INC.
MODINE MFG. CO.
NESBITT, INC., JOHN J.
WING MFG. CO., L. J.

HEATERS, WATER, ELECTRIC

COMBUSTION ENGINEERING INC.

HEATERS, WATER, GAS FIRED

COMBUSTION ENGINEERING INC.
RAYPAK CO., INC.

HEATERS, WATER, INDIRECT

BELL & GOSSETT CO.
WHITLOCK MFG. CO.

HEATERS, WATER, STEAM, INSTANTANEOUS

NOVELTY STEAM BOILER WKS., INC.
TACO HEATERS, INC.
WHITLOCK MFG. CO.

HEATERS, WATER, STEAM, STORAGE

PATTERSON-KELLEY CO., INC.
WHITLOCK MFG. CO.

HOSE, NON-METAL, AND FITTINGS

FLEXAUST CO.

HOUSINGS, FAN, CENTRIFUGAL

BARRY BLOWER CO.
UTILITY FAN CORP., DIV. OF UTILITY APPLIANCE CORP.

HUMIDIFIERS, CENTRAL PLANT

AMERICAN BLOWER CORP.
JOHNSON SERVICE CO.

HUMIDFIERS, DIRECT, SPRAY HEAD

MAID-O'MIST, INC.

HUMIDIFIERS FOR RADIATORS AND CONVECTORS

MAID-O'MIST, INC.

HUMIDIFIERS, RADIATOR VENT VALVE

MAID-O'MIST, INC.

HUMIDISTATS

BARBER-COLMAN CO.
JOHNSON SERVICE CO.
MINNEAPOLIS-HONEYWELL REGULATOR CO.
POWERS REGULATOR CO.

HYGROMETERS

TAYLOR INSTRUMENT COMPANIES

INDICATOR-CONTROLLERS, LIQUID LEVEL, BOILER AND TANK

LIQUIDEPTH INDICATORS, INC.
TAYLOR INSTRUMENT COMPANIES

INDICATOR-CONTROLLERS, PRESSURE

TAYLOR INSTRUMENT COMPANIES

INDICATOR-CONTROLLERS, RELATIVE HUMIDITY

TAYLOR INSTRUMENT COMPANIES

INDICATOR-CONTROLLERS, TEMPERATURE

ILLINOIS TESTING LABORATORIES, INC.
TAYLOR INSTRUMENT COMPANIES

INDICATORS, DEW POINT

ILLINOIS TESTING LABORATORIES, INC.

INSERTS, CONCRETE

CARPENTER & PATERSON, INC.

INSULATION, BOILER AND TANK

KEASBEY & MATTISON CO.

INSULATION, BUILDING

GUSTIN-BACON MFG. CO.
INFRA INSULATION, INC.
MIRACLE ADHESIVES CORP.
REFLECTAL CORP., SUBSIDIARY, BORG-WARNER CORP.

INSULATION, DUCT, SOUND DEADENING (FOR APPLICATION INSIDE DUCT)

GRANT WILSON, INC.
GUSTIN-BACON MFG. CO.
INDUSTRIAL SOUND CONTROL, INC. (Packaged unit to incorporate in ducts)
JOHNS-MANVILLE
L.O.F. GLASS FIBERS CO.

INSULATION, DUCT, THERMAL

ARMSTRONG CORK CO.
GRANT WILSON, INC.
GUSTIN-BACON MFG. CO.
JOHNS-MANVILLE
L.O.F. GLASS FIBERS CO.
MIRACLE ADHESIVES CORP.

INSULATION, FINISHING CEMENT

KEASBEY & MATTISON CO.

INSULATION, PIPE

AMERICAN GILSONITE CO. (Underground)

ARMSTRONG CORK CO.
GUSTIN-BACON MFG. CO.
KEASBEY & MATTISON CO.
MIRACLE ADHESIVES CORP.
PORTER & CO., INC., H. W. (Underground)
UNITED CORK COMPANIES

JOINTS, PIPE, EXPANSION FOR BASEBOARD HEATING

WEBSTER & CO., WARREN

JOINTS, PIPE, EXPANSION, PACKLESS, RUBBER

UNITED STATES RUBBER CO.

LOUVERS AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

AIR & REFRIGERATION CORP.
DURO-DYNE CORP.
SWARTWOUT CO., THE

NAMEPLATES, FOR IDENTIFYING HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT AND CONTROLS

BUNNELL CO., G. F.

MANOMETERS

MERIAM INSTRUMENT CO., THE
TAYLOR INSTRUMENT COMPANIES

MARKERS, PIPE, HOLE AND SADDLE

JEWEL MFG. CO.

METERS, AIR VELOCITY, DIRECT READING

ANEMOSTAT CORP. OF AMERICA
ILLINOIS TESTING LABORATORIES, INC.

METERS, FLOW, STEAM

BUILDERS-PROVIDENCE, INC., DIV. OF B-I-F INDUSTRIES, INC.
MERIAM INSTRUMENT CO., THE
TAYLOR INSTRUMENT COMPANIES

METERS, PROCESS LIQUID

MERIAM INSTRUMENT CO., THE

METERS, VOLUME, AIR AND GAS

MERIAM INSTRUMENT CO., THE

MOTORS, ELECTRIC, FRACTIONAL HP

BALDOR ELECTRIC CO.
CENTURY ELECTRIC CO.
PEERLESS ELECTRIC CO.

MOTORS, ELECTRIC, 1 HP AND OVER

ALLIS-CHALMERS MFG. CO.
BALDOR ELECTRIC CO.
CENTURY ELECTRIC CO.
PEERLESS ELECTRIC CO.
RELIANCE ELECTRIC & ENGINEERING CO.
WAGNER ELECTRIC CORP.

NIPPLES, PIPE

CAPITOL MFG. & SUPPLY CO.
GRINNELL CO., INC.
LADISH CO.

NOZZLES, ATOMIZING

BINKS MFG. CO.
MONARCH MFG. WORKS, INC.
SPRAYING SYSTEMS CO.

NOZZLES, OIL BURNER

MONARCH MFG. WORKS, INC.

NOZZLES, SPRAY

BINKS MFG. CO.
MONARCH MFG. WORKS, INC.
SPRAYING SYSTEMS CO.

OILS, FOR COATING VISCOUS AIR FILTERS

CONTINENTAL AIR FILTERS, INC.

OPERATORS, DAMPER, DUCT

BARBER-COLMAN CO.
JOHNSON SERVICE CO.
MINNEAPOLIS-HONEYWELL REGULATOR CO.
TAYLOR INSTRUMENT COMPANIES

OPERATORS, VALVE

BABBITT STEAM SPECIALTY CO.
JOHNSON SERVICE CO.
PHILADELPHIA GEAR WORKS, INC.
TAYLOR INSTRUMENT COMPANIES

ORIFICES, FLOW MEASURING

TAYLOR INSTRUMENT COMPANIES

ORIFICES, RADIATOR

SARCOTHERM CONTROLS, INC.

PACKING, ASBESTOS

GRANT WILSON, INC.

PANELS, PERFORATED, FOR AIR DIFFUSION

MULTI-VENT DIV., PYLE-NATIONAL CO., THE

PARTS FOR HEATING AND AIR CONDITIONING EQUIPMENT

AIR & REFRIGERATION CORP.
DURO-DYNE CORP.

PIPE, BRASS AND COPPER

HUSSEY & CO., C. G., DIV. OF COPPER RANGE CO.
LEWIN-MATHES CO., LEWIN METALS DIV.
READING TUBE CORP.
REVERE COPPER & BRASS, INC.

PIPE, CAST IRON

DURIRON CO. INC., THE (Acid resisting)

PIPE, LINED

YOUNGSTOWN SHEET & TUBE CO.

PIPE, NICKEL AND NICKEL ALLOY

BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.

PIPE, PRE-INSULATED

DURANT INSULATED PIPE CO.
DURANT INTERNATIONAL CORP.
KAISER CO., E. B.
RIC-WIL, INC

PIPE, SPIRAL, RIVETED AND WELDED

TAYLOR FORGE & PIPE WKS.

PIPE, STEEL, ALLOY

BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.
NATIONAL TUBE DIV., UNITED STATES STEEL CORP.
TAYLOR FORGE & PIPE WKS.
YOUNGSTOWN SHEET & TUBE CO.

PIPE, STEEL, BUTT AND LAP WELDED

NATIONAL TUBE DIV., UNITED STATES STEEL CORP.
SPANG-CHALFANT, DIV. OF THE NATIONAL SUPPLY CO.
YOUNGSTOWN SHEET & TUBE CO.

PIPE, STEEL, SEAMLESS

NATIONAL TUBE DIV., UNITED STATES STEEL CORP.
SPANG-CHALFANT, DIV. OF THE NATIONAL SUPPLY CO.
YOUNGSTOWN SHEET & TUBE CO.

PIPE, STEEL, STAINLESS

BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.

PIPE, VITRIFIED CLAY

STILLWATER CONDUIT DIV.

PLATES, FLOOR AND CEILING

RITTER PATTERN & CASTING CO., INC.

PLASTICS, POWDERS and RESINS (Basic Materials)

GOODRICH CHEMICAL CO., B. F.
PITTSBURGH PLATE GLASS CO.

PREHEATERS, FUEL OIL

DAVIS ENGINEERING CORP.
PATTERSON-KELLEY CO., INC.
PREFERRED UTILITIES MFG. CORP.
WHITLOCK MFG. CO.

PSYCHROMETERS

TAYLOR INSTRUMENT COMPANIES

PULLEYS AND SHEAVES, FOR BELT DRIVES

LAU BLOWER CO.

PUMP-MOTOR UNITS, SELF-CONTAINED

AURORA PUMP DIV., NEW YORK AIR BRAKE CO.
GOULDS PUMPS, INC.
INGERSOLL-RAND CO.

PUMPS, BOILER FEED

AMERICAN-MARSH PUMPS, INC.
DUNHAM CO., C. A.
EAGAN CO., INC., WALTER H.
SKIDMORE CORP.
WEIL PUMP CO.

PUMPS, CENTRIFUGAL

AMERICAN-MARSH PUMPS, INC.
AURORA PUMP DIV., NEW YORK AIR BRAKE CO.
BELL & GOSSETT CO.
BUFFALO PUMPS, INC., DIV. OF BUFFALO FORGE CO.
CHICAGO PUMP CO., SUBSIDIARY OF FOOD MACHINERY & CHEMICAL CORP.
DELAVAL STEAM TURBINE CO.
DUNHAM CO., C. A.
EAGAN CO., INC., WALTER H.
GOULDS PUMPS, INC.
McDONALD MFG. CO., A. Y.

PUMPS, CONDENSATION RETURN

AMERICAN-MARSH PUMPS INC.

CHICAGO PUMP CO., SUBSIDIARY OF FOOD MACHINERY & CHEMICAL CORP.
DUNHAM CO., C. A.
EAGAN CO., INC., WALTER H.
HOFFMAN SPECIALTY MFG. CORP.
NASH ENGINEERING CO.
SKIDMORE CORP.
WEIL PUMP CO.

PUMPS, CONDENSATE, FOR REMOVING CONDENSATION FROM AIR CONDITIONING UNITS

PEERLESS OF AMERICA, INC.

PUMPS, FIRE

AMERICAN-MARSH PUMPS, INC.
CHICAGO PUMP CO., SUBSIDIARY OF FOOD MACHINERY & CHEMICAL CORP.
ECONOMY PUMPS INC., DIV. OF WHEELER MFG. CO., C. H.

PUMPS, PROPORTIONING

EAGAN CO., INC., WALTER H.

PUMPS, RECIPROCATING

AMERICAN-MARSH PUMPS, INC.
McDONALD MFG. CO., A. Y.

PUMPS, ROTARY

McDONALD MFG. CO., A. Y.

PUMPS, SEWAGE AND SLUDGE

CHICAGO PUMP CO., SUBSIDIARY OF FOOD MACHINERY & CHEMICAL CORP.
WEIL PUMP CO.

PUMPS, STEAM

AMERICAN-MARSH PUMPS, INC.

PUMPS, SUMP

CHICAGO PUMP CO., SUBSIDIARY OF FOOD MACHINERY & CHEMICAL CORP.
DEMING CO.
WEIL PUMP CO.

PUMPS, TURBINE TYPE

AMERICAN-MARSH PUMPS, INC.
EAGAN CO., INC., WALTER H.

PUMPS, VACUUM HEATING

CHICAGO PUMP CO., SUBSIDIARY OF FOOD MACHINERY & CHEMICAL CORP.
DUNHAM CO., C. A.
HOFFMAN SPECIALTY MFG. CORP.
NASH ENGINEERING CO.
SKIDMORE CORP.

PUMPS, VISCOUS LIQUIDS AND HEAVY MATERIALS

DELAVAL STEAM TURBINE CO.

PUNCHES, STEEL METAL

DURO-DYNE CORP.

PUSHERS, PIPE, HYDRAULIC

GREENLEE TOOL CO., DIV. OF GREENLEE BROS. & CO.

RADIATION, BASEBOARD, FERROUS

KRITZER RADIANT COILS, INC.
SLANT-FIN RADIATOR CORP.

RADIATION, BASEBOARD, NON-FERROUS

DUNHAM CO., C. A.
KRITZER RADIANT COILS, INC.
NESBITT, INC., JOHN J.
SHAW-PERKINS MFG. CO.
SLANT-FIN RADIATOR CORP.
WEBSTER & CO., WARREN

RADIATION, CONVECTION TYPE, FERROUS

KRITZER RADIANT COILS, INC.
MURRAY MFG. CO., D. J.
SHAW-PERKINS MFG. CO.

RADIATION, CONVECTION TYPE, NON-FERROUS

ACME INDUSTRIES, INC.
AIRTHERM MFG. CO.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
DUNHAM CO., C. A.
KRITZER RADIANT COILS, INC.
MODINE MFG. CO.
NESBITT, INC., JOHN J.
SHAW-PERKINS MFG. CO.
WEBSTER & CO., WARREN

RADIATION, FIN TUBE TYPE

DUNHAM CO., C. A.
G & O MFG. CO.
KRITZER RADIANT COILS, INC.
NESBITT, INC., JOHN J.
SLANT-FIN RADIATOR CORP.
WEBSTER & CO., WARREN

REAMERS, PIPE

REED MFG. CO.

RECORDERS, COMBINED TEMPERATURE AND HUMIDITY

TAYLOR INSTRUMENT COMPANIES

RECORDERS, HUMIDITY

TAYLOR INSTRUMENT COMPANIES

RECORDERS, LIQUID LEVEL

TAYLOR INSTRUMENT COMPANIES

RECORDERS, PRESSURE AND VACUUM

TAYLOR INSTRUMENT COMPANIES

RECORDERS, TEMPERATURE

PALMER THERMOMETERS, INC.
TAYLOR INSTRUMENT COMPANIES

REDUCERS, SPEED

PHILADELPHIA GEAR WORKS, INC.

REFRIGERANTS

GENERAL CHEMICAL DIV., ALLIED CHEMICAL & DYE CORP.
KINETIC CHEMICALS DIV., DU PONT DE NEMOURS & CO., INC., E. I.

REGISTERS

A-J MFG. CO.
AUER REGISTER CO.
BARBER-COLMAN CO.
GENERAL REGISTER CORP.
INDEPENDENT REGISTER CO.
REGISTER & GRILLE MFG. CO., INC.
STEWART MFG. CO., INC.
TITUS MFG. CORP.
WATERLOO REGISTER CO., INC.

REGULATORS, AIR VELOCITY

TAYLOR INSTRUMENT COMPANIES

REGULATORS, DAMPER SETS

DURO-DYNE CORP.
ELGEN MFG. CO.

REGULATORS, DRAFT, COMBUSTION

FIELD CONTROL DIV. OF H. D. CONKEY & CO.
WALKER MFG. & SALES CO.

REGULATORS, LEVEL, LIQUID

ALCO VALVE CO.
GENERAL CONTROLS CO.
TAYLOR INSTRUMENT COMPANIES
WATTS REGULATOR CO.

REGULATORS, PRESSURE, AIR

TAYLOR INSTRUMENT COMPANIES
WATTS REGULATOR CO.

REGULATORS, PRESSURE, GAS

TAYLOR INSTRUMENT COMPANIES

REGULATORS, PRESSURE, HOT WATER HEATING SYSTEM

SARCOTHERM CONTROLS, INC.
WATTS REGULATOR CO.

REGULATORS, PRESSURE, LIQUID

TAYLOR INSTRUMENT COMPANIES
WATTS REGULATOR CO.

REGULATORS, STATIC PRESSURE, AIR DUCT

JOHNSON SERVICE CO.

REGULATORS, TEMPERATURE

BARBER-COLMAN CO.
DETROIT CONTROLS CORP.
FULTON SYLPHON DIV., ROBERTSHAW-FULTON CONTROLS CO.
GENERAL CONTROLS CO.
MERCOID CORP., THE
SARCOTHERM CONTROLS, INC.
TAYLOR INSTRUMENT COMPANIES

RELAYS, ELECTRICAL

ALLEN-BRADLEY CO.

SCOOPS, AIR, FOR DEFLECTING FLOW IN DUCTS

GENERAL REGISTER CORP.

SCREENS, SUN REFLECTING

REFLECTAL CORP., SUBSIDIARY, BORG-WARNER CORP.

SEPARATORS, AIR

COMBUSTION ENGINEERING INC.
DOLLINGER CORP.

SEPARATORS, OIL

AIR-MAZE CORP.

SETS, PIPE BIT, FOR BORING HOLES IN WOOD FOR PIPE AND TUBING

GREENLEE TOOL CO., DIV. OF GREENLEE BROS. & CO.

SHEETS, COPPER

HUSSEY & CO., C. G., DIV. OF COPPER RANGE CO.

SHEETS, STEEL, COPPER BEARING
YOUNGSTOWN SHEET & TUBE CO.

SHEETS, STEEL, GALVANIZED
BETHLEHEM STEEL CO.
WEIRTON STEEL CO.

SILENCERS FOR REDUCING COMPRESSOR INTAKE NOISE
AIR-MAZE CORP.
DOLLINGER CORP.

SOLDER, (SILVER), BRAZING ALLOYS AND FLUXES
HANDY & HARMAN
UNITED WIRE & SUPPLY CORP.

SOLENOIDS AND SOLENOID COILS
ALLEN-BRADLEY CO.

STANDS, PIPE VISE
REED MFG. CO.

STOCKS AND DIES
REED MFG. CO.

STOKERS, INDUSTRIAL AND COMMERCIAL
COMBUSTION ENGINEERING INC.
WILL-BURT CO., THE

STRAINERS, PIPE LINE
ALCO VALVE CO.
ARMSTRONG MACHINE WKS.
FISHER GOVERNOR CO.
HENRY VALVE CO.
SPRAYING SYSTEMS CO.
WATTS REGULATOR CO.
WEBSTER & CO., WARREN

STRAINERS, REFRIGERANT, LIQUID LINE
ALCO VALVE CO.
HENRY VALVE CO.

SURFACE, FINNED, COOLING, BRINE
AEROFIN CORP.
PEERLESS OF AMERICA, INC.
VILTER MFG. CO., THE

SURFACE, FINNED, COOLING, COLD WATER
AEROFIN CORP.
KENNARD CORP.
NESBITT, INC., JOHN J.
PEERLESS OF AMERICA, INC.
VILTER MFG. CO., THE

SURFACE, FINNED, COOLING, DIRECT EXPANSION
AEROFIN CORP.
KENNARD CORP.
PEERLESS OF AMERICA, INC.
VILTER MFG. CO., THE

SURFACE, FINNED, HEATING AND COOLING, PRE-ASSEMBLED, INCLUDING COILS, ELIMINATOR PLATES, SETTLING TANK, AND CASING
CLARAGE FAN CO.
MARLO COIL CO.

SURFACE, FINNED, HEATING, INDIRECT, FERROUS
MURRAY MFG. CO., D. J.
NEW YORK BLOWER CO.

SURFACE, FINNED, HEATING, INDIRECT, NON-FERROUS
AEROFIN CORP.
KENNARD CORP.
MODINE MFG. CO.
NESBITT, INC., JOHN J.

SWITCHES, ELECTRICAL
GENERAL CONTROLS CO.

SWITCHES, FLOAT, REFRIGERATION
ALCO VALVE CO.

SWITCHES, LIQUID LEVEL
ALCO VALVE CO.

SWITCHES, PRESSURE AND VACUUM
DETROIT CONTROLS CORP.

SYSTEMS, CONDENSATE RETURN
STERLING ENGINEERING & MFG. CORP.

SYSTEMS, HEATING, HOT WATER
BELL & GOSSETT CO.
HOFFMAN SPECIALTY MFG. CORP.
SARCOTHERM CONTROLS, INC.
WEBSTER & CO., WARREN

SYSTEMS, HEATING, VACUUM
DUNHAM CO., C. A.

SYSTEMS, HEATING, ZONE CONTROL
BARBER-COLMAN CO.
BELL & GOSSETT CO.
MINNEAPOLIS-HONEYWELL REGULATOR CO.
SARCOTHERM CONTROLS, INC.
SELECTEMP DIV., IRON FIREMAN MFG. CO.
WEBSTER & CO., WARREN

SYSTEMS, ROOF SPRAYING (for cooling roofs)
RUPPRIGHT'S ROTARY ROOF COOLER

TANKS, PROCESS AND STORAGE
NOVELTY STEAM BOILER WKS., INC.

TAPE, DUCT, ADHESIVE
GRANT WILSON, INC.

TESTERS, LEAK, FOR PIPING AND VESSELS
ELVEE CO.

THERMOMETERS, INDICATING, REMOTE-READING
ILLINOIS TESTING LABORATORIES, INC.
TAYLOR INSTRUMENT COMPANIES

THERMOMETERS, INDICATING, INDUSTRIAL
PALMER THERMOMETERS, INC.
TAYLOR INSTRUMENT COMPANIES

THERMOMETERS, INDICATING, WALL
TAYLOR INSTRUMENT COMPANIES

THERMOSTATS, DUCT TYPE
BARBER-COLMAN CO.
CAM-STAT, INC., DIV OF THE PAUL HENRY CO.
JOHNSON SERVICE CO.
MINNEAPOLIS-HONEYWELL REGULATOR CO.

THERMOSTATS, IMMERSION
GENERAL CONTROLS CO.
MINNEAPOLIS-HONEYWELL REGULATOR CO.

THERMOSTATS, ROOM OR WALL
BARBER-COLMAN CO.
DETROIT CONTROLS CORP.
FULTON SYLPHON DIV., ROBERTSHAW-FULTON CONTROLS CO.
GENERAL CONTROLS CO.
JOHNSON SERVICE CO.
MERCOID CORP., THE
MINNEAPOLIS-HONEYWELL REGULATOR CO.
POWERS REGULATOR CO.
SARCOTHERM CONTROLS, INC.

THERMOSTATS, SURFACE
GENERAL CONTROLS CO.

THERMOSTATS, TWO TEMPERATURE OR DUAL
DETROIT CONTROLS CORP.
GENERAL CONTROLS CO.
JOHNSON SERVICE CO.
MINNEAPOLIS-HONEYWELL REGULATOR CO.

THERMOSTATS, WEATHER COMPENSATING
BARBER-COLMAN CO.
DETROIT CONTROLS CORP.
MINNEAPOLIS-HONEYWELL REGULATOR CO.
POWERS REGULATOR CO.
SARCOTHERM CONTROLS, INC.

TOOLS
GREENLEE TOOL CO., DIV. OF GREENLEE BROS. & CO.
RAMSET FASTENING SYSTEM, WINCHESTER-WESTERN DIV. OLIN MATHIESON CHEMICAL CORP.
REMINGTON ARMS CO., INC.

TOWERS, COOLING, ATMOSPHERIC
BINKS MFG. CO.
LILIE-HOFFMANN COOLING TOWERS, INC.
PRITCHARD & CO. OF CALIFORNIA, J. F.

TOWERS, COOLING, MECHANICAL DRAFT
ACME INDUSTRIES, INC.
BALTIMORE AIRCOIL CO., INC.
BINKS MFG. CO.
HALSTEAD & MITCHELL
KENNARD CORP.
LILIE-HOFFMANN COOLING TOWERS, INC.
PHILLIPS COOLING TOWER CO., INC.
PRITCHARD & CO. OF CALIFORNIA, J. F.
REFRIGERATION ENGINEERING, INC.

TRANSFORMERS, ELECTRIC
WAGNER ELECTRIC CORP.

TRAPS, STEAM, FLOAT-THERMOSTATIC
DUNHAM CO., C. A.
HOFFMAN SPECIALTY MFG. CORP.
MARSH HEATING EQUIPMENT CO.
WEBSTER & CO., WARREN

TRAPS, STEAM, MECHANICAL
ANDERSON CO., V. D., THE
ARMSTRONG MACHINE WKS.
HOFFMAN SPECIALTY MFG. CORP.
MARSH HEATING EQUIPMENT CO.
STERLING ENGINEERING & MFG. CORP.
WEBSTER & CO., WARREN

TRAPS, STEAM, THERMOSTATIC
DUNHAM CO., C. A.
HOFFMAN SPECIALTY MFG. CORP.
ILLINOIS ENGINEERING CO., DIV. OF AMERICAN AIR FILTER CO., INC.
MARSH HEATING EQUIPMENT CO.
STERLING ENGINEERING & MFG. CORP.
WEBSTER & CO., WARREN

TUBES, BOILER
BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.

TUBES, CONDENSER
BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.

TUBING, ALUMINUM
UNITED WIRE & SUPPLY CORP.
WOLVERINE TUBE DIV. OF CALUMET & HECLA, INC.

TUBING, BRASS AND COPPER
HUSSEY & CO., C. G., DIV. OF COPPER RANGE CO.
LEWIN-MATHES CO., LEWIN METALS DIV.
READING TUBE CORP.
REVERE COPPER & BRASS, INC.
UNITED WIRE & SUPPLY CORP.
WOLVERINE TUBE DIV. OF CALUMET & HECLA, INC.

TUBING, BRONZE
LEWIN-MATHES CO., LEWIN METALS DIV.

TUBING, FINNED
G & O MFG. CO.
KRITZER RADIANT COILS, INC.
PEERLESS OF AMERICA, INC.
WOLVERINE TUBE DIV. OF CALUMET & HECLA, INC.

TUBING, NICKEL AND NICKEL ALLOY
BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.

TUBING, STEEL, ALLOY, SEAMLESS
BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.
YOUNGSTOWN SHEET & TUBE CO.

TUBING, STEEL, ALLOY, WELDED
YOUNGSTOWN SHEET & TUBE CO.

TUBING, STEEL, SEAMLESS
BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.
YOUNGSTOWN SHEET & TUBE CO.

TUBING, STEEL, STAINLESS
BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.

TUBING, STEEL, WELDED
BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.
YOUNGSTOWN SHEET & TUBE CO.

TURBINES, MECHANICAL DRIVE
WING MFG. CO., L. J.

UNIONS, MALLEABLE, BRASS SEAT
GRINNELL CO., INC.

UNIONS, STEEL
LADISH CO.
WATSON-STILLMAN FITTINGS DIV., H. K. PORTER CO., INC.

UNITS, AIR CONDITIONING, CENTRAL STATION TYPE
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
AMERICAN BLOWER CORP.
CHRYSLER AIRTEMP, DIV. OF CHRYSLER CORP.
CURTIS MFG. CO., REFRIGERATION DIV.
KENNARD CORP.
NESBITT, INC., JOHN J.
UNITED STATES AIR CONDITIONING CORP.
VILTER MFG. CO., THE
YORK CORP.

UNITS, AIR CONDITIONING, HORIZONTAL PACKAGE TYPE
BUSH MANUFACTURING CO.
DRAYER-HANSON, INC., SUBSIDIARY OF NATIONAL-U.S. RADIATOR CORP.
GENERAL ELECTRIC CO., COMMERCIAL & INDUSTRIAL AIR CONDITIONING DEPT.
INTERNATIONAL MFG. CO.
KENNARD CORP.
MODINE MFG. CO.
NESBITT, INC., JOHN J.

UNITS, AIR CONDITIONING, INDUSTRIAL TYPE
AIR & REFRIGERATION CORP.
AMERICAN BLOWER CORP.
CHRYSLER AIRTEMP, DIV. OF CHRYSLER CORP.
CLARAGE FAN CO.
KENNARD CORP.
NESBITT, INC., JOHN J.
SURFACE COMBUSTION CORP.

UNITS, AIR CONDITIONING, REVERSE REFRIGERATION CYCLE
ACME INDUSTRIES, INC.

UNITS, AIR CONDITIONING, SUMMER, ROOM TYPE, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER
KENNARD CORP.
MARLO COIL CO.
MODINE MFG. CO.

UNITS, AIR CONDITIONING, SUMMER, STORE TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR, 3 HP AND OVER
AMERICAN BLOWER CORP.
CURTIS MFG. CO., REFRIGERATION DIV.
GENERAL ELECTRIC CO., COMMERCIAL & INDUSTRIAL AIR CONDITIONING DEPT.

UNITS, AIR CONDITIONING, WINTER, ROOM TYPE, FLOOR CABINET
KENNARD CORP.
MODINE MFG. CO.

UNITS, AIR CONDITIONING, YEAR AROUND, FAN-COIL TYPE, FOR INSTALLATION WITH OR WITHOUT CABINET IN ROOM, OR IN CLOSET SPACE OVER CORRIDOR, etc.
PEERLESS OF AMERICA, INC.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET
BUSH MANUFACTURING CO.
CARRIER CORP.
KENNARD CORP.
MARLO COIL CO.
MODINE MFG. CO.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET, INDUCTION
CARRIER CORP.
YORK CORP.

UNITS, FUEL OIL, HEATING, PUMPING AND STRAINING
EAGAN CO., INC., WALTER H.
PREFERRED UTILITIES MFG. CORP.

VALVES AND FITTINGS
CRANE CO. (General)
GOLDEN-ANDERSON VALVE SPECIALTY CO. (General)
KENNEDY VALVE MFG. CO., THE, (General)
OHIO INJECTOR CO. (General)

VALVES, BALANCING, FOR FORCED HOT WATER HEATING SYSTEMS
BELL & GOSSETT CO.
HOFFMAN SPECIALTY MFG. CORP.
MARSH HEATING EQUIPMENT CO.

VALVES, BRAZED END
WALWORTH CO.

VALVES, CHECK
HENRY VALVE CO.
LUNKENHEIMER CO.
MILLER VALVE CO., INC.
POWELL CO., WM., THE

VALVES, COMPRESSOR
VILTER MFG. CO., THE

VALVES, DIAPHRAGM
GRINNELL CO., INC.
HENRY VALVE CO.
POWERS REGULATOR CO.
TAYLOR INSTRUMENT COMPANIES
WATTS REGULATOR CO.

VALVES, FIRE PROTECTION, SPRINKLER SYSTEM CONTROL
ALLEN MFG. CO., W. D.
GRINNELL CO., INC.

VALVES, FLOAT
ALCO VALVE CO.
FISHER GOVERNOR CO.
MAID-O'MIST, INC.
ROBERT MFG. CO.

VALVES, FLOW CONTROL, FOR HOT WATER HEATING SYSTEMS
BELL & GOSSETT CO.
JACKES-EVANS MFG. CO.
WEBSTER & CO., WARREN

VALVES, GATE, ALLOY
LUNKENHEIMER CO.
POWELL CO., WM., THE

VALVES, GATE, BRASS AND BRONZE
JENKINS BROS.
KENNEDY VALVE MFG. CO., THE
LUNKENHEIMER CO.
POWELL CO., WM., THE

VALVES, GATE, IRON BODY
KENNEDY VALVE MFG. CO., THE
LUNKENHEIMER CO.
OHIO INJECTOR CO.
POWELL CO., WM., THE

VALVES, GATE, STEEL
LUNKENHEIMER CO.
POWELL CO., WM., THE

VALVES, GLOBE, ALLOY
LUNKENHEIMER CO.
POWELL CO., WM., THE

VALVES, GLOBE, BRASS AND BRONZE
HENRY VALVE CO.
KENNEDY VALVE MFG. CO., THE
LUNKENHEIMER CO.
OHIO BRASS CO.
POWELL CO., WM., THE

VALVES, GLOBE, IRON BODY
HENRY VALVE CO.
KENNEDY VALVE MFG. CO., THE
LUNKENHEIMER CO.
OHIO INJECTOR CO.
POWELL CO., WM., THE

VALVES, GLOBE, STEEL
HENRY VALVE CO.
LUNKENHEIMER CO.
POWELL CO., WM., THE

VALVES, MIXING, STEAM AND WATER
JOHNSON SERVICE CO.

VALVES, NEEDLE
HENRY VALVE CO.

VALVES, PLASTIC
LUNKENHEIMER CO.

VALVES, PLUG
OHIO INJECTOR CO.

VALVES, PRESSURE REDUCING AND REGULATING, AIR AND GAS
FISHER GOVERNOR CO.
WATTS REGULATOR CO.

VALVES, PRESSURE, REDUCING AND REGULATING, HOT WATER
BELL & GOSSETT CO.
FISHER GOVERNOR CO.
HOFFMAN SPECIALTY MFG. CORP.
WATTS REGULATOR CO.
WEBSTER & CO., WARREN

VALVES, PRESSURE REDUCING AND REGULATING, STEAM
FISHER GOVERNOR CO.
HOFFMAN SPECIALTY MFG. CORP.
WATTS REGULATOR CO.

VALVES, RADIATOR, AIR, FOR HOT WATER RADIATORS
HOFFMAN SPECIALTY MFG. CORP.
MAID-O'MIST, INC.

VALVES, RADIATOR, AIR, FOR STEAM RADIATORS
GORTON HEATING CORP.
HOFFMAN SPECIALTY MFG. CORP.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, SELF CONTAINED, PACKLESS
POWERS REGULATOR CO.

VALVES, RADIATOR, STEAM AND HOT WATER
SARCOTHERM CONTROLS, INC.

VALVES, RADIATOR, STEAM AND HOT WATER, HAND
MARSH HEATING EQUIPMENT CO.
WEBSTER & CO., WARREN

VALVES, RADIATOR, STEAM AND HOT WATER, MODULATING
MARSH HEATING EQUIPMENT CO.
WEBSTER & CO., WARREN

VALVES, REFRIGERATION (ANGLE, CHECK, GATE, GLOBE, NEEDLE, RELIEF)
HENRY VALVE CO.
VILTER MFG. CO., THE

VALVES, REFRIGERATION, BACK PRESSURE
ALCO VALVE CO.
TAYLOR INSTRUMENT COMPANIES
VILTER MFG. CO., THE

VALVES, REFRIGERATION, EXPANSION, CONSTANT PRESSURE
ALCO VALVE CO.
DETROIT CONTROLS CORP.
VILTER MFG. CO., THE

VALVES, REFRIGERATION, EXPANSION, THERMOSTATIC
ALCO VALVE CO.
DETROIT CONTROLS CORP.
VILTER MFG. CO., THE

VALVES, REFRIGERATION, FLOAT
ALCO VALVE CO.
VILTER MFG. CO., THE

VALVES, REFRIGERATION, LIQUID CONTROL, FLOAT PILOTED
ALCO VALVE CO.

VALVES, REFRIGERATION, MAGNETIC STOP
DETROIT CONTROLS CORP.

VALVES, RELIEF, HOT WATER, PRESSURE OPERATED
BELL & GOSSETT CO.
WATTS REGULATOR CO.
WEBSTER & CO., WARREN

VALVES, SOLDER JOINT
LUNKENHEIMER CO.

VALVES, SOLENOID
ALCO VALVE CO.
DETROIT CONTROLS CORP.
JACKES-EVANS MFG. CO.
SPORLAN VALVE CO.

VALVES, 2, 3, AND 4 WAY
ALCO VALVE CO.
JOHNSON SERVICE CO.

VANES, DUCT TURNING, PREFABRICATED
BARBER-COLMAN CO.
DURO-DYNE CORP.
ELGEN MFG. CO.

VENTILATORS, ROOF, FAN
AMMERMAN CO., C. L.
CARNES CORP.
COOK CO., LOREN
DEBOTHEZAT FANS DIV., AMERICAN MACHINE & METALS, INC.
KODY BLOWER CO.
PENN VENTILATOR CO.
SWARTWOUT CO., THE

VENTILATORS, ROOF, GRAVITY
AIR DEVICES, INC.
PENN VENTILATOR CO.
SWARTWOUT CO., THE
WESTERN ENGINEERING & MFG. CO.

VENTILATORS, ROOF, WITH FUSIBLE LINKS, FOR VENTING PRODUCTS OF COMBUSTION
SWARTWOUT CO., THE

VENTILATORS, UNIT
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
NESBITT, INC., JOHN J.

VISES, PIPE
REED MFG. CO.

WASHERS, AIR
AIR & REFRIGERATION CORP.
CLARAGE FAN CO.

WELDERS, SPOT
DURO-DYNE CORP.

WHEELS, BLOWER
BARRY BLOWER CO.
LAU BLOWER CO.
UTILITY FAN CORP., DIV. OF UTILITY APPLIANCE CORP.

WIRING, COMPLETE ASSEMBLIES, CUSTOM-MADE
CORNISH-RUTLAND CO.

WRENCHES, CHAIN, PIPE
REED MFG. CO.

DIRECTORY SECTION
HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRY AND LARGE BUILDINGS
PART 2—ALL PRODUCTS CLASSIFIED

ABSORBERS, SHOCK, LIQUID, TO ELIMINATE WATER HAMMER IN PIPING

American Metal Hose Div., American Brass Co., Waterbury, Conn.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Greer Hydraulics, Inc., Jamaica, N. Y.
Josam Manufacturing Co., Michigan City, Ind.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Smith Co., S. Morgan, York, Pa.
Wade Mfg. Co., Elgin, Ill.

ABSORBERS, VIBRATION

See Hose, Flexible, Metal and Fittings; Bases and Pads, Vibration Isolating

ABSORBERS, VIBRATION, FOR REFRIGERANT AND OTHER PIPE LINES

American Metal Hose Div., The American Brass Co., Waterbury, Conn.
Atlantic Metal Hose Co., Inc., New York, N. Y.
Beltran Associates, Inc., Brooklyn, N. Y.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Cobra Metal Hose Div., Chicago, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexonics Corp., Maywood, Ill.
Industrial Sound Control, Inc., Hartford, Conn.
Johnson Metal Hose, Inc., Waterbury, Conn.
Korfund Co., Inc., Long Island City, N. Y.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Resistoflex Corp., Belleville, N. J.
Seamlex Co., Inc., Long Island City, N. Y.
Techniflex Corp., Port Jervis, N. Y.
Titeflex, Inc., Newark, N. J.
United Metal Hose Co., Inc., Long Island City, N. Y.
Vibration Mounting, Inc., Elmhurst, N. Y.
Wade Mfg. Co., Elgin, Ill.

ABSORPTION DEHUMIDIFIERS

See Dehumidifiers, Absorption and Adsorption

ABSORPTION REFRIGERATION MACHINES

See Machines, Refrigeration, Absorption

ACCESS DOORS AND PANELS

See Doors and Panels, Access

ACCUMULATORS, REFRIGERATION (FOR AIR CONDITIONING)

Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Dole Refrigerating Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
King Zeero Co., The, Chicago, Ill.
McQuay, Inc., Minneapolis, Minn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Phillips & Co., H. A., Chicago, Ill.
Reco Products Div., Recony Corp., New York, N. Y.
Remco, Inc., Zelienople, Pa.
Roessing Mfg. Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Temprite Products Corp., Birmingham, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
Wolverine Tube, Div. of Calumet & Helca, Inc., Detroit, Mich.
XL Refrigerating Co., Chicago, Ill.

ADHESIVES, FOR INSULATION OTHER THAN PIPE

Asbestos Asphalt Insulation Co., Chicago, Ill.
Atlas Mineral Products Co., Merztown, Pa.
Carey Mfg. Co., Philip, Cincinnati, O.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Durkee-Atwood Co., Minneapolis, Minn.
Eagle-Picher Co., Cincinnati, O.
Flintkote Co., The, New York, N. Y.
Formica Co., Cincinnati, O.
Fuller Co. of Calif., H. B., San Francisco, Calif.
Gilbreth Co., The, Philadelphia, Pa. (Teflon)
Grant Wilson Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
Miracle Adhesives Corp., New York, N. Y.
Moore Inc., Goodloe E. Danville, Ill.
National Pipe Coatings, Inc., Hungtington Park, Calif.
Presstite Engineering Co., St. Louis, Mo.
Rubber & Asbestos Corp., Bloomfield, N. J.
St. Clair Rubber Co., Detroit, Mich.
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.

ADHESIVES, FOR PIPE COVERING

Arabol Mfg. Co., New York, N. Y.
Armstrong Cork Co., Lancaster, Pa.
Asbestos Asphalt Insulation Co., Chicago, Ill.
Carey Mfg. Co., Philip, Cincinnati, O.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Durkee-Atwood Co., Minneapolis, Minn.
Flintkote Co., The, New York, N. Y.
Foster Co., Benjamin, Philadelphia, Pa.
Fuller Co. of Calif., H. B., San Francisco, Calif.
Gates Engineering Co., Wilmington, Del.
Grant Wilson, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., Detroit, Mich.
Miracle Adhesives Corp., New York, N. Y.
Moore Inc., Goodloe E., Danville, Ill.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
National Cork Co., Englewood, N. J.
Pecora Paint Co., Inc., Philadelphia, Pa.
Presstite Engineering Co., St. Louis, Mo.
Rubber & Asbestos Corp., Bloomfield, N. J.
Ruberoid Co., New York, N. Y.
St. Clair Rubber Co., Detroit, Mich.
Sauereisen Cements Co., Pittsburgh, Pa.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill.
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.
Swift & Co., Chicago, Ill.
Xylos Rubber Co., Akron, O.

ADSORBERS, ODOR

Abbeon Supply Co., Jamaica, N. Y.
Carbide and Carbon Chemicals Div., Union Carbide & Carbon Corp., New York, N. Y.
Chemurgic Process Corp., New York, N. Y.
Connor Engineering Corp., Danbury, Conn.
Elgin Softener Corp., Elgin, Ill.
Manning Co., Charles E., Pittsburgh, Pa.
Pur Air Div., Barnebey-Cheney Co., Columbus, O.
Radex Corp., Chicago, Ill.
Research Products Corp., Madison, Wis.
Reynolds Electric Co., River Grove, Ill.
S.O.S. Products Co., Inc., Brooklyn, N. Y.
Tamms Industries, Inc., Chicago, Ill.
Williams Chemical Co., New York, N. Y.

ADSORPTION DEHUMIDIFIERS

See Dehumidifiers, Absorption and Adsorption

AFTERCOOLERS, COMPRESSED AIR

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Adams Co., Inc., R. P., Buffalo, N. Y.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
American Moistening Co., Providence, R. I.
Andale Co., Philadelphia, Pa.
Armstrong Co., Richard M., Westchester, Pa.
Brown Fintube Co., The, Elyria, O.
Bury Compressor Co., Erie, Pa.
Buxton Mfg. Co., Dover, N. J.
Centrifix Corp., Cleveland, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Condenser Service & Engineering Co. Inc., Hoboken, N. J.
Davis Engineering Corp.. Elizabeth, N. J.
Downington Iron Works, Downington, Pa.
Doyle and Roth Mfg. Co., Inc., Brooklyn, N. Y.
Graham Mfg. Co., Inc., New York, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Johnson Corp., The, Three Rivers, Mich.
Joy Mfg. Co., Pittsburgh, Pa.
Kewanee-Ross Corp., Kewanee, Ill.
Manning & Lewis Engineering Co., Newark, N. J.
Modine Mfg. Co., Racine, Wis.
Niagara Blower Co., New York, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Schramm, Inc., West Chester, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., Bronx, N. Y.

AIR AFTERCOOLERS

See Aftercoolers, Compressed Air

AIR BREAK FITTINGS

See Fittings, Draining, Fixed Air Break

AIR CLEANERS

See Cleaners, Air, Electrical

AIR COMPRESSORS

See Compressors, Air

AIR CONDITIONERS

See Units, Air Conditioning

AIR CONDITIONING UNITS

See Units, Air Conditioning

AIR DIFFUSERS

See Diffusers, Air; Grilles; Panels Perforated, for Air Diffusion; Registers

AIR ELIMINATORS

See Eliminators, Air

AIR FILTER CLEANING COMPOUNDS
See Compounds, Cleaning, Air Filter

AIR FILTER GAGES
See Gages, Air Filter

AIR FILTERS
See Filters, Air

AIR FRESHENING
See Compounds, Air Freshening; Adsorbers, Odor

AIR OPERATING VALVES
See Valves, Air Operating

AIR PURIFICATION
See Adsorbers, Odor; Compounds, Air Freshening

AIR RECOVERY EQUIPMENT
See Adsorbers, Odor

AIR SEPARATORS
See Separators, Air

AIR-TANKLESS WATER HEATERS
See Heaters, Water, Air-Tankless

AIR VALVES
See Valves, Radiators, Air

AIR VELOCITY METERS
See Meters, Air Velocity, Direct Reading; Anemometers

AIR VENTS
See Eliminators, Air

AIR VOLUME METERS
See Meters, Volume, Air and Gas

AIR WASHERS
See Washers, Air

ALARMS, COMBUSTIBLE GAS
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Hogart Engineering Co., Los Angeles, Calif.
Johnson-Williams Inc., Palo Alto, Calif.
Mine Safety Appliances Co., Pittsburgh, Pa.
Taller & Cooper, Inc., Brooklyn, N. Y.

ALARMS, HIGH AND LOW BOILER WATER
American District Telegraph Co., New York, N. Y.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Campbell Co., J. A., Long Beach, Calif.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Defender Instrument & Regulator Co., St. Louis, Mo.
Diamond Power Specialty Corp., Lancaster, O.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Econo Products Company, Inc., Div. of Viking Instruments Inc., East Haddam, Conn.
Englehard, Inc., Charles, East Newark, N. J.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fischer & Porter Co., Hatboro, Pa.
Johnson Corp., The, Three Rivers, Mich.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Magnetrol, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reliance Gauge Column Co., Cleveland, O.
Schaub Engineering Co., Fred H., Chicago, Ill.
Techniflex Corp., Port Jervis, N. Y.
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.

ALARMS, HIGH AND LOW FLOW, FOR PIPING SYSTEMS
Brooks Rotameter Co., Lansdale, Pa.
Magnetrol, Inc., Chicago, Ill.
Techniflex Corp., Port Jervis, N. Y.

ALARMS, LIQUID LEVEL, AUDIBLE
American District Telegraph Co., New York, N. Y.
Automatic Control Co., St. Paul, Minn.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Boston Auto Gage Co., Pittsfield, Mass.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., St. Louis, Mo.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Magnetrol, Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Reliance Gauge Column Co., Cleveland, O.
Ripley Co., Inc., Middletown, Conn.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scully Signal Co., Melrose, Mass.
Techniflex Corp., Port Jervis, N. Y.
Uehling Instrument Co., Paterson, N. J.
Wright-Austin Co., Detroit, Mich.

ALARMS, LIQUID LEVEL, VISUAL
Automatic Control Co., St. Paul, Minn.
Bristol Co., The, Waterbury, Conn.
Englehard, Inc., Charles, East Newark, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Instruments, Inc., Tulsa, Okla.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Magnetrol, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Uehling Instrument Co., Paterson, N. J.

ALARMS, SMOKE
American District Telegraph Co., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cardox Corp., Chicago, Ill.
Cleveland Fuel Equipment Co., Cleveland, Ohio
Defender Instrument & Regulator Co., St. Louis, Mo.
De-Tec-Tronic Corp., Chicago, Ill.
Edwards, L. V., Rockville Center, N. Y.
Electronics Corp. of America, Cambridge, Mass.
Ess Instrument Co., Bergenfield, N. J.
Heat-Timer Corp., New York, N. Y.
Instruments, Inc., Tulsa, Okla.
McNeill Smoke Eliminator Co., Chicago, Ill.
Ripley Co., Inc., Middletown, Conn.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Sterns-Flinn Corp., New York, N. Y.
Worner Electronic Devices, Rankin, Ill.

ALARMS, TEMPERATURE
American District Telegraph Co., New York.
Bristol Co., The, Waterbury, Conn.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Custom Mfg. Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., St. Louis, Mo.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fischer & Porter Co., Hatsboro, Pa.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Moeller Instrument Co., Richmond Hill, N. Y.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
United Electric Controls Co., Watertown, Mass.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

ALGAE AND SLIME CONTROL, WATER TREATMENT FOR
See Treatment, Water, for Slime and Algae Control

ALUMINUM COATED SHEETS
See Sheets, Aluminum Coated

ALUMINUM PIPE
See Pipe, Aluminum

ALUMINUM SHEETS
See Sheets, Aluminum

ANALYZERS, CARBON DIOXIDE, PORTABLE
Airserco Mfg. Co., Inc., Pittsburgh, Pa. (electrical)
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Cardox Corp., Chicago, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Engelhard, Inc., Chas., Newark, N. J.
Hays Corp., Michigan City, Ind.
Permutit Co., New York, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Service to Industry, West Hartford, Conn.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Uehling Instrument Co., Paterson, N. J.
Victory Engineering Corp., Union, N. J.
Will Corp., Rochester, N. Y.

ANCHORS FOR INSULATION
See Fasteners, Insulation

ANEMOMETERS
Abbeon Supply Co., Jamaica, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Beckman & Whitley, Inc., San Carlos, Calif.
Dietzgen Co., Eugene, Chicago, Ill.
Flow Corp., Cambridge, Mass. (Hot wire)
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
General Scientific Equipment Co., Philadelphia, Pa.
Hill, E. Vernon & Co., Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Mine Safety Appliances Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.

ANGLE VALVES
See Valves, Angle

ANGLES, BARS, BEAMS, CHANNELS AND TEES (LIGHT WEIGHT SHAPES)
Allegheny Ludlum Steel Corp., Pittsburgh, Pa. (Stainless)
Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
Atlantic Steel Co., Atlanta, Ga.
Bethlehem Steel Co., Bethlehem, Pa.
Bridgeport Brass Co., Bridgeport, Conn. (aluminum)
Byers Co., A. M., Pittsburgh, Pa.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Dow Chemical Co., The, Midland, Mich.
Harvey Aluminum, Torrance, Calif.
Inland Steel Co., Chicago, Ill.
Inland Steel Products Co., Milwaukee, Wis.
International Steel Co., Evansville, Ind.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Kling Bros. Engineering Wks., Chicago, Ill.
Laclede Steel Co., St. Louis, Mo.

Lees Div., John, The Serrick Corp., Muncie, Ind.
Mesker Steel Corp., Geo. L., Evansville, Ind.
Redi-Bolt, Inc., East Chicago, Ind.
Republic Steel Corp., Cleveland, O.
Revere Copper and Brass, Incorporated, New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
Truscon Steel Div., Republic Steel Corp., Youngstown, O.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

ANODES FOR CORROSION PROTECTION

See Devices, Electrolytic, for Preventing Corrosion

ANTI-FREEZE COMPOUNDS FOR SNOW MELTING

See Compounds, Anti-Freeze

AQUASTATS

See Thermostats

ARC WELDERS

See Welders, Arc

ARC WELDING ELECTRODES

See Electrodes, Arc Welding

ASBESTOS FIBER AND CEMENT PIPE

See Pipe, Asbestos Fiber and Cement

ASBESTOS MATERIALS

See Insulation

ASBESTOS PACKING

See Packing, Asbestos

ASH CONVEYORS

See Conveyors, Coal and Ash

ASSEMBLIES, MANIFOLD, FOR METERS

Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.

ATOMIZING NOZZLES

See Nozzles, Atomizing

AXIAL FLOW FANS

See Fans, Axial Flow, Pressure Type

BACKING RINGS

See Rings, Welding

BALANCE CLIPS

See Clips, Balance, Blower Wheel

BALANCING ELBOWS FOR HOT WATER HEATING SYSTEMS

See Elbows, Balancing, for Hot Water Heating Systems

BALANCING EQUIPMENT

See Equipment, Balancing

BALANCING VALVES

See Valves, Balancing

BALL BEARINGS

See Bearings, Ball

BAROMETRIC CONTROLS

See Controls, Draft, Barometric

BASEBOARD RADIATION

See Radiation, Baseboard

BASES, MOTOR, TENSION ADJUSTING

Ackermann Mfg. Co., Wheeling, W. Va.
Alexander Bros., Philadelphia, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Electrovent Fan & Mfg. Co., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Reeves Pully Co., Columbus, Ind.
Rhoads & Sons, J. E., Wilmington, Del.
Valley Foundry & Machine Works, Inc., Fresno, Calif.

BASES AND PADS, VIBRATION ISOLATING

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Barry Controls, Inc., Watertown, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Celotex Corp., The, Chicago, Ill.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Felters Company, The, Boston, Mass.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Firestone Industrial Products, Akron, O.
General Tire & Rubber Co., Industrial Products Div., Wabash, Ind.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hobsite Products Co., Harrison, N. J.
Johns-Manville, New York, N. Y.
Korfund Co., Inc., Long Island City, N. Y.
L.O.F. Glass Fibers Co., Toledo, O.
Lord Mfg. Co., Erie, Pa.
M B Mfg. Co., The, New Haven, Conn.
Mundet Cork Corp., North Bergen, N. J.
National Cork Co., Englewood, N. J.
National Lead Co., New York, N. Y.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Raybestos-Manhattan, Inc., Passaic, N. J.
Robinson Aviation, Inc., Teterboro, N. J.
Sponge Products Div., B. F. Goodrich Co., Shelton, Conn.
Spring Packing Corp., Chicago, Ill.
United Cork Companies, Kearny, N. J.
United States Rubber Co., New York, N. Y.
Vibration Eliminator Co., Long Island City, N. Y.
Vibration Mounting, Inc., Elmhurst, L. I., N. Y.
Western Felt Works, Chicago, Ill.
Wood Conversion Co., St. Paul, Minn.

BEARINGS, BALL

Ahlberg Bearing Co., Chicago, Ill.
Bearings Co. of America, Federal Mogul Corp., Lancaster, Pa.
Boston Gear Works, Quincy, Mass.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., The, New Britain, Conn.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Nice Ball Bearing Co., Philadelphia, Pa.
Norma-Hoffman Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Philadelphia, Pa.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, NEEDLE

Roller Bearing Co. of America, West Trenton, N. J.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.

BEARINGS, PILLOW BLOCK

Ahlberg Bearing Co., Chicago, Ill.
Anti-Friction Bearings Co., Los Angeles, Calif.
Bearings Co. of America Div., Federal Mogul Corp., Lancaster, Pa.
Boston Gear Works, Quincy, Mass.
Central Die Casting & Mfg. Co., Inc., Chicago, Ill.
Chain Belt Co., Milwaukee, Wis.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clizbe Bros., Mfg. Co., Plymouth, Ind.
Congress Drives Div., Tann Corp., Detroit, Mich.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., The, New Britain, Conn.
Goldens' Foundry & Machine Co., Columbus, Ga.
Jeffrey Mfg. Co., Columbus, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Lau Blower Co., Dayton, O.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
Moraine Products Div., General Motors Corp., Dayton, O.
Randall Graphite Bearings, Inc., Lima, O.
Royersford Foundry & Machine Co., Inc., Royersford, Pa.
SKF Industries, Inc., Philadelphia, Pa.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Shafer Bearing, Div. of Chain Belt Co., Downers Grove, Ill.
Sprout, Waldron & Co., Muncy, Pa.
Standard Pressed Steel Co., Jenkintown, Pa.
Triangle Mfg. Co., Oshkosh, Wis.
Whiteley Bearing Corp., Chicago, Ill.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, ROLLER

Berna Co., A. J., Detroit, Mich.
Chain Belt Co., Milwaukee, Wis.
Dodge Mfg. Corp., Mishawaka, Ind.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
Norma-Hoffman Bearings Corp., Stamford, Conn.
Roller Bearing Co. of America, West Trenton, N. J.
Royersford Foundry & Machine Co, Inc., Royersford, Pa.
SKF Industries, Inc., Philadelphia, Pa.
Shafer Bearing, Div. of Chain Belt Co., Downers Grove, Ill. (self aligning)
Timken Roller Bearing Co., Canton, O.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.

BEARINGS, SLEEVE

Aetna Ball & Roller Bearing Co., Chicago, Ill.
Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
Bronze Bearings, Inc., Cranford, N. J.
Cleveland Graphite Bronze Co., Cleveland, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Federal-Mogul Corp., Detroit, Mich.
Gatke Corp., Chicago, Ill.
Green Fuel Economizer Co., Beacon, N. Y.
Haveg Corp., Newark, Del. (plastic)
International Powder Metallurgy, Inc., Ridgway, Pa.
Johnson Bronze Co., New Castle, Pa.
Keystone Carbon Co., Inc., St. Marys, Pa.
Lau Blower Co., Dayton, O.
Link Belt Co., Chicago, Ill.
Moraine Products Div., General Motors Corp., Dayton, O.
Morganite, Inc., Carbon Specialties Div., Long Island City, N. Y.
Morrison Products Inc., Cleveland, O.
Randall Graphite Bearings, Inc., Lima, O.
Whiteley Bearing Corp., Chicago, Ill.

BELLOWS, THERMOSTATIC AND METALLIC

Arrowhead Rubber Co., Long Beach, Calif.
Bishop & Babcock Mfg. Co., Cleveland, O.
Breeze Corporations, Inc., Union, N. J.
Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., Bridgeport, Conn.
Bristol Co., The, Waterbury, Conn.
Clifford Mfg. Co., of Standard-Thomson Corp., Waltham, Mass.
Cook Electric Co., Chicago, Ill.
Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Flexonics Corp., Maywood, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Solar Aircraft Co., San Diego, Calif.
Titeflex, Inc., Newark, N. J.
Zallea Bros., Wilmington, Del.

BELTING, FLAT, LEATHER

Alexander Bros., Philadelphia, Pa.
Allen Mfg. Co., W. D. Chicago, Ill.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Graton & Knight Co., Worcester, Mass.
Houghton & Co., E. F., Philadelphia, Pa.
Rhoads & Sons, J. E., Wilmington, Del.
Schieren Co., Chas. A., New York, N. Y.
Sikes Co., S. R., Minneapolis, Minn.
Williams & Son, I. B., Dover, N. H.

BELTING, FLAT, RUBBER

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins, Inc., Stamford, Conn.
New York Belting & Packing Co., Passiac, N. J.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Thermoid Co., Trenton, N. J.
United States Rubber Co., New York, N. Y.

BELTS, TOOTH-GRIP OR COG

Dayton Rubber Co., Dayton, O.
Lovejoy Flexible Coupling Co., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.

BELTS, V

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
America Pulley Co., Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Maysville, Ky.
Congress Drives Div., Tann Corp., Detroit, Mich.
Continental Rubber Wks., Erie, Pa.
Dayton Rubber Co., Dayton, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Gates Rubber Co., Denver, Colo.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Manheim Mfg. & Belting Co., Manheim, Pa.
Maurey Mfg. Corp., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Pyott Foundry & Machine Co., Chicago, Ill.
Quaker Rubber Corp., Div., of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Reeves Pully Co., Columbus, Ind.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Rhoads & Sons, J. E., Wilmington, Del.
Schieren Co., Chas. A., New York, N. Y.
Sikes Co., S. R., Minneapolis, Minn. (leather)
Thermoid Co., Trenton, N. J.
United States Rubber Co., New York, N. Y.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J.
Zatko Metal Products Co., Euclid, O.

BENDERS, PIPE

American Pipe Bending Machine Co., Inc., Poultney, Vt.
American Pipe Tool Co., Chicago, Ill.
Blackhawk Mfg. Co., Milwaukee, Wis.
Buffalo Forge Co., Buffalo, N. Y.
Capewell Mfg. Co., Hartford, Conn.
Crown Die & Tool Corp., Chicago, Ill. (Hand)
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Holsclaw Bros., Inc., Evansville, Ind.
Hossfeld Mfg. Co., Winona, Minn.
Imperial Brass Mfg. Co., Chicago, Ill.
Knights Co., James, Sandwich, Ill.
National Pipe Bending Co., New Haven, Conn.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Pedrick Tool & Machine Co., Philadelphia, Pa.
Pines Engineering Co., Inc., Aurora, Ill.
Radiant Devices, St. Louis, Mo.
Sac Tool Mfg. Co., St. Louis, Mo.
Skinner Co., M. B., South Bend, Ind.
Tal Bender, Inc., Milwaukee, Wis.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vanderman Mfg. Co., Willimantic, Conn.
Wallace Supplies Mfg. Co., Chicago, Ill.
Wilson Co., K. R., Arcade, N. Y.

BENDERS, TUBING

Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Wks., Allentown, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Duro Metal Products Co., Chicago, Ill.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Griffith Equipment Co., Inc., Los Angeles, Calif.
Holsclaw Bros., Inc., Evansville, Ind.
Hossfeld Mfg. Co., Winona, Minn.
Imperial Brass Mfg. Co., Chicago, Ill.
Keeney Mfg. Co., Newington, Conn.
National Pipe Bending Co., New Haven, Conn.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Parker Appliance Co., The, Cleveland, O.
Pedrick Tool & Machine Co., Philadelphia, Pa.
Pines Engineering Co., Inc., Aurora, Ill.
Republic Steel Corp., Steel and Tubes Div., Cleveland, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Steel City Electric Co., Pittsburgh, Pa.
Tal Bender, Inc., Milwaukee, Wis.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Wallace Supplies Mfg. Co., Chicago, Ill.
Wilson Co., K. R., Arcade, N. Y.

BENDS, EXPANSION, STEAM PIPE

Albert Pipe Supply Co., Brooklyn, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Atlantic Pipe Bending & Fabricating Corp., Wood-Ridge, N. J.
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa.
Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Durant Insulated Pipe Co., Palo Alto, Calif.
Flori Pipe Co., The, St Louis, Mo.
Grinnell Co., Inc., Providence, R. I.
Hi-Flow Products, Inc., Copiague, N. Y.
Kaiser Co., E. B., Glenview, Ill.
Kellogg Co., M. W., The, New York, N. Y. (Corrugated steel)
Lumsden & Van Stone Co., Div. of Midwest Piping Co., Inc., South Boston, Mass.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Parks-Cramer Co., Fitchburg, Mass.
Pittsburgh Pipe Coil & Bending Co., Etna, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Rempe Co., Chicago, Ill.
Ric-wiL, Inc., Barberton, O.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Shaw Co., Benjamin F., Wilmington, Del.
Shaw-Kendall Engineering Co., Toledo, O.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Western Piping & Engineering Co., San Francisco, Calif.
Whitlock Mfg. Co., Hartford, Conn.

BI-METALS, THERMOSTATIC

Baker & Co., Inc., Newark, N. J.
Chace Co., W. M., Detroit, Mich.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Wilson Co., H. A., The, Union, N. J.

BLADES, PROPELLER FAN

Ackermann Mfg. Co., Wheeling, W. Va.
Aerovent Fan Co., Inc., Piqua, O.
Aire-Foile Fan & Blower Co., Detroit, Mich.
Airmaster Corp., Chicago, Ill.
Alloy Propeller, Zelionople, Pa.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Brookside Products Co., Inc., McCordsville, Ind.
Burden Co., Alan E., Los Angeles, Calif.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Dayton Rubber Co., Dayton, O.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Dual-Air Fan Co., South Elgin, Ill.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Frigid, Inc., Brooklyn, N. Y.
International Engrg. Inc., Dayton, O.
Kody Blower Co., Trenton, N. J.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Martin Fan & Blower Co., Chicago, Ill.
Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Myers Electric Co., Inc., Pittsburgh, Pa.
Peerless Electric Co., Warren, O.
Propellair Div., Robbins & Myers Inc., Springfield, O.
Robinson Ventilating Co., Zelionople, Pa.
Roto-Beam, Chicago, Ill.
Schwitzer-Cummins Co., Indianapolis, Ind.
South Bend Air Products, Inc., South Bend, Ind.
Standard Electric Mfg. Co., West Berlin, N. J.
Thermal Industries, Indio, Calif.
Torrington Mfg. Co., Torrington, Conn.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Wind-Way Fan & Ventilator Co., New Orleans, La.

BLAST GATES

See Gates, Blast

BLAST HEATERS

See Surface, Finned, Heating

BLAST HEATING COILS

See Surface, Finned, Heating

BLINDS, LINE, PIPE

Hamer Valves, Inc., Long Beach, Calif.
Vernon Tool Co., Ltd., Alhambra, Calif.

BLOCKS, TERMINAL, FOR ELECTRICAL CONNECTIONS

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Kulka Electric Mfg. Co., Inc., Mt. Vernon, N. Y.
Marathon Electric Mfg. Corp., Wausau, Wis.
Sealed Unit Parts Co., Inc., Bronx, N. Y.

BLOW PIPE FITTINGS

See Fittings, Blow Pipe

BLOWER FANS

See Fans, Axial Flow and Fans, Centrifugal

BLOWER HOUSINGS

See Housings, Fan

BLOWER WHEELS

See Wheels, Blower

BLOWERS, HIGH PRESSURE

For Low Pressure Blower Fans, See Fans, Centrifugal

Aladdin Heating Corp., Oakland, Calif.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Blower Corp., Detroit, Mich.
Barry Blower Co., Minneapolis, Minn.
Bayley Blower Co., Milwaukee, Wis.
Beach-Russ Co., New York, N. Y.
Brookside Products Co., Inc., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Carling Turbine Blower Co., Worcester, Mass.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
De Laval Steam Turbine Co., Trenton, N. J.
Dynamic Air Engineering, Inc., Los Angeles, Calif.

Eclipse Fuel Engineering Co., Rockford, Ill.
Elliott Co., Jeannette, Pa.
Frigid, Inc., Brooklyn, N. Y.
General Blower Co., Morton Grove, Ill.
Hauck Mfg. Co., Brooklyn, N. Y.
Ilg Electric Ventilating Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg., Pittsburgh, Pa.
Lammert & Mann Co., Chicago, Ill.
Leiman Bros., Inc., Newark, N. J.
Martin Fan & Blower Co., Chicago, Ill.
North American Mfg. Co., Cleveland, O.
Peerless Electric Co., Warren, O.
Power Engineering Co., Chicago, Ill.
Prat-Daniel Corp., South Norwalk, Conn.
Read Standard Corp., Blower-Stoker Div., York, Pa.
Research Vacuum Supply Co., Chicago, Ill.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Roots-Connersville Blower Corp., Connersville, Ind.
Spencer Turbine Co., Hartford, Conn.
Standard Electric Mfg. Co., West Berlin, N. J.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

BLOWERS, SOOT

Air Fan Engineering Co., Los Angeles, Calif.
Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
Bayer Co., St. Louis, Mo.
Chesterton Co., A. W., Everett, Mass.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Diamond Power Specialty Corp., Lancaster, O.
Marion Machine Foundry & Supply Co., Marion, Ind.

BLOW-OFF VALVES

See Valves, Blow-off

BLUE PRINT MACHINES

See Machines, Blue Print and White Print

BOARDS, PANEL AND CONTROL

Ace Engineering Co., Chicago, Ill.
Adam Electric Co., Frank, St. Louis, Mo.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Automatic Switch Co., Orange, N. J.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Devco Engineering, Inc., Caldwell, N. J.
Falstrom Co., Passaic, N. J.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hays Corp., Michigan City, Ind.
International Business Machines Corp., New York, N. Y.
Johns-Manville, New York, N. Y.
Littleford Bros., Inc., Cincinnati, O.
Marsh Instrument Co., Skokie, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Norristown Magnesia & Asb. Co., Norristown, Pa.
Square D Co., Detroit, Mich.
Taller & Cooper, Inc., Brooklyn, N. Y.
Trerice Co., H. O., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Whiddett Co., John C., Bala-Cynwyd, Pa.
Will-Burt Co., Orrville, O.
York-Shipley, Inc., York, Pa.

BOILER CLEANING COMPOUNDS

See Compounds, Boiler Cleaning

BOILER FEED PUMPS

See Pumps, Boiler Feed

BOILER FEEDERS

See Feeders, Water, Heating Boiler

BOILER GAGES

See Gages, Liquid Level

BOILER OBSERVATION PORTS

See Ports, Observation, Boiler

BOILER SEALING COMPOUNDS

See Compounds, Boiler and Radiator Sealing

BOILER AND TANK INSULATION

See Insulation, Boiler and Tank

BOILER TUBES

See Tubes, Boiler

BOILER WATER ALARMS

See Alarms, High and Low Boiler Water

BOILERS, ELECTRIC

See Generators, Steam, Electric

BOILERS, HEATING, CAST IRON, SECTIONAL

2000 *Sq Ft Steam Radiation and Over*

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bryant, Div. of Carrier Corp., Indianapolis.
Burnham Corp., Irvington, N. Y.
Crane Co., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Mueller Climatrol, Milwaukee, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Peerless Heater Co., The, Div. of the Eastern Foundry Co., Boyertown, Pa. (gas fired)
Pennsylvania Furnace & Iron Co., Warren, Pa.
Prox Co., Inc., Frank, Terre Haute, Ind.
Richmond Radiator Co., Metuchen, N. J.
Smith Co., Inc., H. B., The, Westfield, Mass.
Surface Combustion Corp., Toledo, O.
Weil-McLain Co., Michigan City, Ind.

BOILERS, HEATING, STEEL, FIRE TUBE

2000 *Sq Ft Steam Radiation and Over*

Aldrich Co., Wyoming, Ill.
Ames Iron Works, Inc., Oswego, N. Y.
Atlantic Steel Boiler Co., Philadelphia, Pa.
Bigelow Co., New Haven, Conn.
Birchfield Boiler, Inc., Tacoma, Wash.
Boiler Engineering & Supply Co., Inc., Phoenixville, Pa.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Burkhart Engineering Associates, Inc., Boston, Mass.
Burnham Corp., Irvington, N. Y.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Combustion Engineering, Inc., New York.
Crotty Mfg. Corp., Flushing, L. I., N. Y.
Dillon Steam Boiler Wks., Inc., D. M., Fitchburg, Mass.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Edge Moor Iron Works, Inc., Edge Moor, Del.
Erie City Iron Wks., Erie, Pa.
Farrar & Trefts, Div. of ADSCO Industries, Buffalo, N. Y.
Fitzgibbons Boiler Co., Inc., New York, N. Y.
Gabriel Boiler & Fabrication Co., Portland, Ore.
Hamburg Boiler Works, Inc., Hamburg, Pa.
Hodge Boiler Wks., East Boston, Mass.
International Engineering Wks., Inc., Framingham, Mass.
Johnston Bros., Inc., Ferrysburg, Mich.
Kewanee-Ross Corp., Kewanee, Ill.
Leffel & Co., James, Springfield, O.
Lookout Boiler & Mfg. Co., Chattanooga.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
Mund Boilers, Inc., Los Angeles, Calif.
Murray Iron Wks. Co., Burlington, Ia.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Norse Boiler Co., Inc., New Market, N. J.
Orr & Sembower, Inc., Reading, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa. (400 sq ft thru 56830 sq ft)
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Smith Twin Tubular Boiler Co., Inc., Philadelphia, Pa.
Spencer Heater, Lycoming Division, Avco Mfg. Corp., Williamsport, Pa.
Stout & Sons, David, St. Louis, Mo.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Titusville Iron Wks. Co., The, Titusville, Pa.
Wickes Boiler Co., Saginaw, Mich.
York-Shipley, Inc., York, Pa.

BOILERS, HEATING, STEEL, TUBELESS

Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Eckhart Mfg. Co., Inc., Union, N. J.
Republic Products Co., Philadelphia, Pa.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
York-Shipley, Inc., York, Pa.

BOILERS, HEATING, STEEL, WATER TUBE

Ajax Boiler & Heater Co., Gardena, Calif.
Anetsberger Bros., Inc., Northbrook, Ill.
Auburn Burner Co., Auburn, Ind.
Babcock & Wilcox Co., New York, N. Y.
Bigelow Co., The, New Haven, Conn.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Bryan Steam Corp., Peru, Ind.
Central States Steel Boiler Co., Chicago, Ill.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Combustion Engineering, Inc., New York, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crotty Mfg. Corp., Flushing, L. I., N. Y.
Edge Moor Iron Wks., Inc., Edge Moor, Del.
Erie City Iron Wks., Erie, Pa.
International Boiler Wks. Co., The, East Stroudsburg, Pa.
Keeler Co., E., Williamsport, Pa.
Koven & Bro., L. O., Inc., Jersey City, N. J.
Mund Boilers, Inc., Los Angeles, Calif.
Murray Iron Wks., Co., Burlington, Ia.
Nebraska Boiler Company, Inc., Lincoln, Nebr.
Parker, Sid E., Los Angeles, Calif.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif.
Raypak Co., Inc., Los Angeles, Calif.
Riley Stoker Corp., Worcester, Mass.
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
San Gabriel Boiler Mfg. Co., San Gabriel, Calif.
Shepard Heater Co., Inc., Terre Haute, Ind.
Springfield Boiler Co., Springfield, Ill.
Titusville Iron Works Co., The, Titusville, Pa.
V. & E. Products, Inc., Schuylkill Haven, Pa.
Viking Mfg. Corp., Cleveland, O.
Vogt Machine Co., Henry, Louisville, Ky.
Wickes Boiler Co., Saginaw, Mich.
York-Shipley, Inc., York, Pa.
Zingheim Co., William C., Chicago, Ill.

BOILERS, PACKAGED UNITS, HEATING AND PROCESS—*Including Controls, Feed Pump, etc.*

Ames Iron Works, Inc., Oswego, N. Y.
Babcock & Wilcox Co., New York, N. Y.
Bigelow Co., The, New Haven, Conn.
Boiler Engineering & Supply Co., Phoenixville, Pa.
Bros Boiler & Mfg. Co., Wm., Minneapolis
Brown Fintube Co., The, Elyria, O.
Burkhart Engineering Associates, Inc., Boston, Mass.
Clayton Mfg. Co., El Monte, Calif.
Cleaver-Brooks Co., Milwaukee, Wis.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Combustion Engineering, Inc., New York. N. Y. (4,000 lb/Hr to 40,000 lb/Hr)
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cyclotherm Div., National-U. S. Radiator Corp., Oswego, N. Y.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Edge Moor Iron Works, Inc., Edge Moor, Del.
Edwards Engineering Corp., Pompton Plains, N. J.

Erie City Iron Works, Erie, Pa.
Farrar & Trefts, Div. of ADSCO Industries, Buffalo, N. Y.
Fitzgibbons Boiler Co., Inc., New York, N. Y.
Foster Wheeler Corp., New York, N. Y.
Gabriel Boiler & Fabrication Co., Portland, Ore. (3-500 HP)
Hoffberger Co., C., Baltimore, Md. (12 to 600 hp, oil fuel, 15 to 150 psi)
Hydrotherm, Inc., Northvale, N. J. (Gas Fired only. 45,000 to 500,000 Btu input; 100 psi ASME)
International Boiler Works Co., East Stroudsburgh, Pa.
Iron Fireman Mfg. Co., Cleveland, O.
Johnston Bros., Inc., Ferrysburg, Mich.
Keeler Co., E., Williamsport, Pa.
Kewanee-Ross Corp., Kewanee, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Leffel & Co., James, Springfield, O.
Littleford Bros., Inc., Cincinnati, O.
Lookout Boiler & Mfg. Co., Chattanooga, Tenn.
Martin Co., Inc., J. O., San Francisco, Calif.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Mund Boilers, Inc., Los Angeles, Calif.
Murry Iron Works Co., Burlington, Ia.
Novelty Steam Boiler Works, Inc., Baltimore, Md.
Orr & Sembower, Inc., Reading, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa. (510 sq ft oil or gas)
Parker, Sid E., Los Angeles, Calif.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif. (1½ Hp - 125 Hp. Pressure to 200 psi)
Patco Mfg. Co., Philadelphia, Pa. (580 to 720 sq ft)
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa. (oil: 440-1440 edr; 0-30 psi oil; and gas)
Petro, Cleveland, O. (up to 450 hp gas, oil and combination; high pressure)
Preferred Utilities Mfg. Corp., New York. (20 to 600 boiler hp. Design pressure from 15 to 250 psi. All grades of oil and gas or combination gas and oil)
Ray Oil Burner Co., San Francisco, Calif.
Republic Products Co., Philadelphia, Pa.
Rite Engineering & Mfg. Corp., Los Angeles.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O. (114,000 to 1,000,000 Btu gas or oil)
Sellers Engineering Co., Chicago, Ill.
Springfield Boiler Co., Springfield, Ill. (6,000 to 45,000 lb per hr, 200 to 900 psig, gas & oil fired)
Superior Combustion Industries, Inc., New York, N. Y.
Texsteam Corp., Houston, Tex.
Titusville Iron Works Co., The, Titusville, Pa.
Union Iron Works, Erie, Pa.
Vapor Heating Corp., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky. (10,000 to 40,000 lb of steam per hr capacities)
Wickes Boiler Co., Saginaw, Mich.
York-Shipley, Inc., York, Pa.

BOILERS, PORTABLE, STEAM FOR STEAM CLEANING, MISCELLANEOUS PROCESS, OTHER USES

Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Lookout Boiler & Mfg. Co., Chattanooga, Tenn.
Murray Iron Wks. Co., Burlington, Ia.
Texsteam Corp., Houston, Tex.
Vapor Heating Corp., Chicago, Ill.

BOLTS, EXPANSION

Arro Expansion Bolt Co., Marion, O.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago, Ill.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Industrial Screw Co., Chicago, Ill.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
National Lead Co., New York, N. Y.
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind.
Polis Mfg. Co., J. D., Chicago, Ill.
Rawlplug Co., Inc., The, New York, N. Y.
Star Expansion Bolt Co., New York, N. Y.
Star Stainless Screw Co., Paterson, N. J.
U. S. Expansion Bolt Co., York, Pa.

BOLTS AND STUDS, FLANGE

Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Clark Bros. Bolt Co., Milldale, Conn.
Continental Screw Co., New Bedford, Mass.
Crane Co., Chicago, Ill.
Erie Bolt & Nut Co., Erie, Pa.
Harper Co., H. M., Morton Grove, Ill.
Haskell Mfg. Co., Wm. H., Pawtucket, R. I.
Industrial Screw Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
Polis Mfg. Co., J. D., Chicago, Ill.
Redi-Bolt, Inc., East Chicago, Ind.
Republic Steel Corp., Bolt & Nut Div., Cleveland, O.
Rockford Screw Products Co., Rockford, Ill.
Russell, Purdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Star Stainless Screw Co., Paterson, N. J.
Victor Products Corp., Chicago, Ill.
Wolfe Co., Inc., The, Franklin C., Culver City, Calif.

BOLTS, TOGGLE AND ANCHOR

Arro Expansion Bolt Co., Marion, O.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago, Ill.
Crawford Co., Chicago, Ill.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Huck Mfg. Co., Detroit, Mich.
Industrial Screw Co., Chicago, Ill.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
Moore, Inc., Goodloe E., Danville, Ill.
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind.
Polis Mfg. Co., J. D., Chicago, Ill.
Rawlplug Co., Inc., The, New York, N. Y.
Republic Steel Corp., Cleveland, O.
Star Expansion Bolt Co., New York, N. Y.
Star Stainless Screw Co., Paterson, N. J.
U. S. Expansion Bolt Co., York, Pa.
Western Wire Products Co., St. Louis, Mo. (flattened lag)

BOLTS, "U"

Allmetal Screw Products Co., Inc., Long Island, N. Y.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Republic Steel Corp., Cleveland, O.
Steel City Electric Co., Pittsburgh, Pa.

BOOKS, TECHNICAL DATA

Color-Art Printing & Stationery Co., Kirkwood, Mo.
Lefax Publishers, Philadelphia, Pa.

BOOSTERS, GAS

Beach-Russ Co., New York, N. Y.
Bury Compressor Co., Erie, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eisler Engineering Co., Inc., Newark, N. J.
Leiman Bros., Inc., Newark, N. J.
North American Mfg. Co., Cleveland, O.
Research Vacuum Supply Co., Chicago, Ill.
Roots-Connersville Blower Div., Connersville, Ind.

BOOTHS, PAINTING, SPRAY

Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., The, Harrison, N. J.
Burdett Mfg. Co., Chicago, Ill.
Carolina Blower Co., Inc., Greensboro, N. C.
Centri-Spray Corp., Livonia, Mich. (wet type)
DeVilbiss Co., The, Toledo, O.
Goethel Sheet Metal Works, Inc., Alfred, Milwaukee, Wis.
Kirk & Blum Mfg. Co., Cincinnati, O.
Lumm Co., A. H., Toledo, O.
Mahon Co., R. C., The, Detroit, Mich.
M & E Mfg. Co., Indianapolis, Ind.
Newcomb-Detroit Co., Detroit, Mich.
Peters-Dalton, Inc., Detroit, Mich.
Plummer Spray Equipment Co., Napolean, O.
Schmieg Industries, Detroit, Mich.
Spray Engineering Co., Somerville, Mass.
Thomas Industries, Inc., Electric Sprayit Div., Sheboygan, Wis.
Young & Bertke Co., Cincinnati, O.

BRAKES, SHEET METAL, HAND

Barth Engineering & Mfg. Co., Milldale, Conn.
Dreis & Krump Mfg. Co., Chicago, Ill.
Niagara Machine & Tool Works, Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
St. Louis Tool Co., St. Louis, Mo.
Whitney Metal Tool Co., Rockford, Ill.

BRAKES, SHEET METAL, PORTABLE

Barth Engineering & Mfg. Co., Milldale, Conn.
Dreis & Krump Mfg. Co., Chicago, Ill.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Whitney Metal Tool Co., Rockford, Ill.

BRAKES, SHEET METAL, POWER

Bath Co., Cyril, The Solon, O.
Cincinnati Shaper Co., Cincinnati, O.
Cleveland Crane & Eng. Co., Wickliffe, O.
Diamond Machine Tool Co., Pico, Calif.
Dreis & Krump Mfg. Co., Chicago, Ill.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn.
Verson Allsteel Press Co., Chicago, Ill.
Verson Mfg. Co., The, Dallas, Tex.
Whitney Metal Tool Co., Rockford, Ill.
Wilson Co., K. R., Arcade, N. Y. (Hydraulic)

BRASS PIPE

See Pipe, Brass and Copper

BRASS TUBING

See Tubing, Brass and Copper

BRASS UNIONS

See Unions, Brass

BRASS VALVES

See Valves, Gate; and Valves, Globe

BRAZING TORCHES

See Torches, Brazing

BREAKERS, VACUUM (For Steam Using Equipment)

Associated Valve & Engineering Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Simplex Valve & Meter Co., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
McAlear Mfg. Co., Chicago, Ill.
Perfecting Service Co., Charlotte, N. C.
Schade Valve Mfg. Co., Philadelphia, Pa.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Co., Indianapolis, Ind.
Webster & Co., Warren, Camden, N. J.

BRONZE VALVES

See Valves, Gate; and Valves, Globe

BUILDING INSULATION

See Insulation, Building

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL

Adams Mfg. Co., Cleveland, O.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Aston Products, Inc., Hazel Park, Mich.
Auburn Foundry Inc., Stoker Div., Auburn, Ind.
Automatic Firing Corp., St. Louis, Mo.
Barber Mfg. Co., Cleveland, O.

Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Burdett Mfg. Co., Chicago, Ill.
Certified Furnace Co., Div. Stainless & Steel Products Co., St. Paul, Minn.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Columbia Boiler Co. of Pottstown, Pottstown, Pa.
Coppus Engineering Corp., Worcester, Mass.
Dalzen Mfg. Co., St. Clair, Mich.
Downing Steel Products, Dayton, O.
Eclipse Fuel Engrg. Co., Rockford, Ill.
Eisler Engineering Co., Inc., Newark, N. J.
Engineer Co., New York, N. Y.
Faber Engineering Co., Inc., Philadelphia, Pa.
Forney Engineering Co., Dallas, Tex.
Fuelguard Co., Dallas, Tex.
Gordon & Piatt, Inc., P. O. Box 331, Winfield, Kan.
Haney Gas Burner & Engineers, Inc., Monrovia, Calif.
Hastings Air Control, Inc., Omaha, Nebr.
Hauck Mfg. Co., Brooklyn, N. Y.
Iron Fireman Mfg. Co., Cleveland, O.
Jackson & Church Co., Saginaw, Mich.
Jamieson Mfg. Co., Dallas, Tex.
Jerry Finn Engineers, St. Paul, Minn.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Laharco Industries, Minneapolis, Minn.
Leahy Mfg. Co., Los Angeles, Calif.
Lennox Industries, Inc., The, Marshalltown, Ia.
Lientz Co., B. P., Kansas City, Mo.
Mahr Mfg. Co., Minneapolis, Minn.
Martin Co., Inc., J. O., San Francisco, Calif.
Maxon Premix Burner Co., Muncie, Ind.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Mid-Continent Metal Products Co., Chicago, Ill.
Mutual Liquid Gas & Equipment Co., Gardena, Calif.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Newcomb-Detroit Co., Detroit, Mich.
Norman Products Co., Inc., Columbus, O.
North American Mfg. Co., Cleveland, O.
Orr & Sembower, Inc., Reading, Pa.
Peabody Engrg. Corp., New York, N. Y.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Petro, Cleveland, O.
Radiant Heat & Cooling Co., Santa Clara, Calif.
Ransome Co., Emeryville, Calif.
Ray Oil Burner Co., San Francisco, Calif.
Rayfield-Staffco Burner Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Riley Stoker Corp., Worcester, Mass.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Rockwell Co., W. S., Fairfield, Conn.
Sellers Engineering Co., Chicago, Ill.
Siemon Mfg. Co., Grandview, Mo.
Sonner Burner Co., Winfield, Kan.
Standard Fuel Engineering Co., Detroit, Mich.
Staples & Pfeiffer, San Francisco, Calif.
Stout & Sons, David, St. Louis, Mo.
Sullivan Valve & Engineering Co., Butte, Mont.
Superior Combustion Industries, Inc., New York, N. Y.
Surface Combustion Corp., Toledo, O.
Synchronous Flame, Inc., Walworth, Wis.
Timken Silent Automatic Div., Rockwell Spring & Axle Co., Jackson, Mich.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Vacuum Gas Burner, Olean, N. Y.
Watts Regulator Co., Lawrence, Mass.
Webster Engineering Co., Tulsa, Okla.
Williams Div., Eureka Williams Co., Div. of Henney Motor Co. Inc., Bloomington, Ill.
York-Shipley, Inc., York, Pa.
Zink Co., John, Tulsa, Okla.
Zurn Mfg. Co., J. A., Industrial Div., Erie, Pa.

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL, COMBINED WITH STOKER OR OVER COAL GRATES

Barber Mfg. Co., Cleveland, O.
Forney Engineering Co., Dallas, Tex.
Gordon & Piatt, Inc., Winfield, Kan.
Iron Fireman Mfg. Co., Cleveland, O.
Jackson & Church Co., Saginaw, Mich.
Lientz Co., B. P., Kansas City, Mo.
Maxon Premix Burner Co., Muncie, Ind.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Norman Products Co., Columbus, O.
Riley Stoker Corp., Worcester, Mass.
Webster Engineering Co., Tulsa, Okla.

BURNERS, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL

Ace Engineering Co., Chicago, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Automatic Firing Corp., St. Louis, Mo.
Babcock & Wilcox Co., New York, N. Y.
Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Coppus Engineering Corp., Worcester, Mass.
Eclipse Fuel Engineering Co., Rockford, Ill.
Engineer Co., New York, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., San Francisco, Calif.
Faber Engineering Co., Inc., Philadelphia, Pa.
Forney Engineering Co., Dallas, Tex.
Gordon & Piatt, Inc., Winfield, Kan.
Haney Gas Burner & Engineers, Monrovia, Calif.
Hauck Mfg. Co., Brooklyn, N. Y.
Iron Fireman Mfg. Co., Cleveland, O.
Jackson & Church Co., Saginaw, Mich.
Lammert & Mann Co., Chicago, Ill.
Leahy Mfg. Co., Los Angeles, Calif.
Lientz Co., B. P., Kansas City, Mo.
Mahr Mfg. Co., Minneapolis, Minn.
Maxon Premix Burner Co., Muncie, Ind.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
National Airoil Burner Co., Inc., Philadelphia, Pa.
North American Mfg. Co., Cleveland, O.
Orr & Sembower, Inc., Reading, Pa.
Peabody Engineering Corp., New York, N. Y.
Petro, Cleveland, O.
Preferred Utilities Mfg. Corp., New York.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Ray Oil Burner Co., San Francisco, Calif.
Rayfield-Staffco Burner Co., Chicago, Ill.
Riley Stoker Corp., Worcester, Mass.
Rockwell Co., W. S., Fairfield, Conn.
Siemon Mfg. Co., Grandview, Mo.
Simplex Oil Heating Corp., Philadelphia, Pa.
Sonner Burner Co., Winfield, Kan.
Staples & Pfeiffer, San Francisco, Calif.
Stout & Sons, David, St. Louis, Mo.
Superior Combustion Industries, Inc., New York, N. Y.
Surface Combustion Corp., Toledo, O.
Synchronous Flame, Inc., Walworth, Wis.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Webster Engineering Co., Tulsa, Okla.
York-Shipley, Inc., York, Pa.
Zink Co., John, Tulsa, Okla.

BURNERS, OIL, COMMERCIAL AND INDUSTRIAL

Ace Engineering Co., Chicago, Ill. (Rotary)
Airtemp, Div. of Chrysler Corp., Dayton, O.
Aldrich Co., Wyoming, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Automatic Burner Corp., Chicago, Ill. (high pressure)
Automatic Firing Corp., St. Louis, Mo. (high pressure gun type)
Babcock & Wilcox Co., New York, N. Y.
Beckett Corp., R. W., Elyria, O. (high pressure)
Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Carlin Co., The, Wethersfield, Conn.
Century Engrg. Corp., Cedar Rapids, Ia. (high pressure atomizing)
Certified Furnace Co., Div. Stainless & Steel Products Co., St. Paul, Minn.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Conco Engineering Works, Div. of H. D. Conkey & Co., Mendota, Ill.
Dalmo-Victor Co., San Carlos, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Delta Heating Corp., Trenton, N. J. (high pressure)
Diesel Oil Burner Corp. of New York, Jamaica, Long Island, N. Y.
Drying Systems, Inc., Chicago, Ill.
Eckhart Mfg. Co., Inc., Union, N. J. (High pressure atomizing)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eds-Wil Burner Corp., Chicago, Ill.
Electrol Burner Mfg. Co., Inc., Rutherford, N. J. (high pressure atomizing)
Engineering Co., New York, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., San Francisco, Calif.
Faber Engineering Co., Inc., Philadelphia, Pa.
Federal Oil Burner Co., Inc., Philadelphia, Pa. (rotary)
Forney Engineering Co., Dallas, Tex. (both steam atomizing & mechanical, high pressure)
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Haney Gas Burner & Engineers, Inc., Monrovia, Calif. (steam atomizing)
Hardinge Oil Burner & Mfg. Co., Chicago, Ill.
Hauck Mfg. Co., Brooklyn, N. Y. (low pressure air and high pressure steam)
Ingersoll Conditioned Air Div., Borg-Warner Corp., Kalamazoo, Mich.
Iron Fireman Mfg. Co., Cleveland, O. (Rotary atomizing, high pressure atomizing)
Jackson & Church Co., Saginaw, Mich.
Kol-Master Corp., Oregon, Ill. (high pressure)
Lammert & Mann Co., Chicago, Ill. (low pressure air or steam atomization)
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y. (horizontal rotary-belt & direct)
Leahy Mfg. Co., Los Angeles, Calif.
Lennox Industries, Inc., Marshalltown, Ia. (high pressure)
Lientz Co., B. P., Kansas City, Mo. (steam atomizing)
Mahr Mfg. Co., Minneapolis, Minn.
Malleable Iron Fittings Co., Branford, Conn.
Maxon Premix Burner Co., Muncie, Ind.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif. (high pressure atomizing and steam atomizing)
Montag Inc., Portland, Ore.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
National Oil Burner Co. of N. Y. Inc., Brooklyn, N. Y. (low pressure, high pressure, steam rotary)
National-U. S. Radiator Corp., Johnstown, Pa.
North American Mfg. Co., Cleveland, O.
Nu-Way Corp., The, Rock Island, Ill.
Orr & Sembower, Inc., Reading, Pa. (air atomizing) (Capacity range: 15 hp-500 hp. Fuels: Light oil, heavy oil or gas or any combination of these.)
Peabody Engrg. Corp., New York, N. Y.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Petro, Cleveland, O. (high pressure and rotary atomizing)
Preferred Utilities Mfg. Corp., New York, N. Y., (Rotary types; from 7½ gph to 175 gph.)
Quiet Automatic Oil Burner Corp., Newark, N. J. (high pressure atomizing)
Quiet-Heet Mfg. Corp., Newark, N. J.
Radiant Utilities Corp., Brooklyn, N. Y. (high pressure)
Ray Oil Burner Co., San Francisco, Calif. (High pressure atomizing rotary)
Rayfield-Staffco Burner Co., Chicago, Ill. (low pressure atomizing and horizontal rotary)
Reif-Rexoil, Inc., Buffalo, N. Y.
Riley Stoker Corp., Worcester, Mass.
Rockwell Co., W. S., Fairfield, Conn.
Schurs Oil Burner Co., Los Angeles, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silent Glow Oil Burner Co., Hartford, Conn.

Simplex Oil Heating Corp., Philadelphia, Pa. (Low and high pressure atomizing, and horizontal rotary types)
Staples & Pfeiffer, San Francisco, Calif. (High pressure and steam atomizing, variable capacity)
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind. (low and high pressure)
Sun-Ray Burner Mfg. Corp., Jamaica, N. Y.
Superior Combustion Industries, Inc., New York, N. Y. (rotary)
Synchronous Flame, Inc., Walworth, Wis. (High pressure atomizing)
Timken Silent Automatic Div., Rockwell Spring & Axle Co., Jackson, Mich.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y. (Variable capacity, rotary, pressure atomizing, steam atomizing)
Utah Hydro Corp., Salt Lake City, Utah
Weatherall Engineers, Inc., Providence, R. I.
Webster Engineering Co., Tulsa, Okla.
Will-Burt Co., The, Orrville, O. (High pressure)
Williams Div., Eureka Williams Co., Div. of Henney Motor Co., Inc., Bloomington, Ill.
Wisconsin Oil Burner Co., Madison, Wis.
York-Shipley, Inc., York, Pa. (Rotary, high pressure atomizing)
Zink Co., John, Tulsa, Okla.

BURNERS, PULVERIZED COAL, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.
Whiting Corp., Harvey, Ill.

BURNERS, PULVERIZED COAL AND GAS, COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., New York., N. Y.
Foster Wheeler Corp., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

BURNERS, PULVERIZED COAL, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., New York, N. Y.
Engineer Co., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

BURNERS, PULVERIZED COAL AND OIL, COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., New York, N. Y.
Blokolgas System, Inc., Detroit, Mich.
Foster Wheeler Corp., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

CABINETS FOR AIR CONDITIONERS, BOILERS, ETC.

See Parts For Heating and Air Conditioning Equipment

CABLE, ELECTRIC HEATING

Chester Cable Corp., Chester, N. Y.
Electromode Corp., Rochester, N. Y.
Everwarm, Inc., Knoxville, Tenn.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Modernheat Cable Corp., Kingsport, Tenn.
Preferred Utilities Mfg. Corp., New York, N. Y.
Roberson Co., L. N., Seattle, Wash.
S & C Mfg. Co., Cincinnati, O.
Sunwarm, Inc., Kingsport, Tenn.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wrap-On Co., Chicago, Ill.

CABLE AND WIRE, THERMOSTAT

Chester Cable Corp., Chester, N. Y.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Roberson Co., L. N., Seattle, Wash.
United States Rubber Co., New York, N. Y.
Wiegand Co., Edwin L., Pittsburgh, Pa.

CALCULATORS, AIR CONDITIONING, HEATING, VENTILATING, AND PIPING; SLIDE RULE

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Armstrong Furnace Co., Columbus, O.
Calculator Specialties Co., Chicago, Ill.
Graphic Calculator Co., Chicago., Ill.
Morton Engineering Service, Paul S., Lawrence, Mich. (Btu calculator, area and volume calculator and temperature difference convertor calculator. Area and crackage calculator Btuh calculator)

CAPACITORS, ELECTRICAL, FOR POWER FACTOR CORRECTION

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Capacitor Dept., Hudson Falls, N. Y.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
Mallory Co., P. R., Inc., Indianapolis, Ind.
Potter Co., The, North Chicago, Ill.
Sprague Electric Co., North Adams, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.

CAPILLARY TUBING

See Tubing, Capillary

CAPS, VENT FLUE

Accurate Sheet Metal Mfg. Works, Chicago, Ill.
Acme Mfg. Co., Philadelphia, Pa.
Adams Co., The, Dubuque, Iowa
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Airjet Ventilator Co., El Monte, Calif.
Ammerman Co., C. L., Minneapolis, Minn.
Boston Machine Works Co., Lynn, Mass.
Breidert Co., G. C., San Fernando, Calif.
Coleman Co., Inc., The, Wichita, Kan.
Corbman Bros., Inc., Philadelphia, Pa.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Ohio Foundry & Mfg. Co., Steubenville, O.
Oil Equipment Mfg. Corp., New Haven, Conn.
Penn Ventilator Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Robinson Clay Products Co., The, Akron, O.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Wallace Co., William, Metalbestos Div., Belmont, Calif.
Waverly Heating Supply Co., Boston, Mass.
Wood Mfg. Co., A. R., Luverne, Minn.

CARBON DIOXIDE ANALYZERS

See Analyzers, Carbon Dioxide, Portable

CARBON DIOXIDE INDICATORS

See Indicators, Carbon Dioxide, Boiler Room

CARBON PIPE, TUBING, FITTINGS AND VALVES

See Pipe, Tubing, Fittings and Valves, Carbon and Graphite

CAST IRON PIPE

See Pipe, Cast Iron

CATALOG HOLDERS AND FILES

See Holders and Files, Catalog

CEMENT AND COMPOUNDS, PIPE JOINT

Acorn Paint & Chemical Co., Cleveland, O.
Akron Metallic Gasket Co., Akron, O.
Arco Co., The, Cleveland, O.
Armite Laboratories, Los Angeles, Calif.
Babbitt Chemical Co., New Bedford, Mass.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Black & White Chemical Co., New York, N. Y.
Blue Ridge Talc Co., Inc., Henry, Va.
Blue Seal Chemical Co., Roselle Park, N. J.
Cabot, Inc., Samuel, Boston, Mass.
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chicago Gasket Co., Chicago, Ill.
Continental Products Co., Euclid, O.
Crane Co., Chicago, Ill.
Crane Packing Co., Chicago, Ill.
Croll & Son, Jesse G., Philadelphia, Pa.
Dixon Crucible Co., Joseph, Jersey City, N. J.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gasoilair Equipment Co., New Haven, Conn.
Gilbreth Co., The, Philadelphia, Pa.
Greene, Tweed & Co., North Wales, Pa.
Grinnell Co., Inc., Providence, R. I.
Hercules Chemical Co., Inc.. New York, N. Y.
Highside Chemicals Co., A Unit of Stewart Industries, Inc., Clifton, N. J.
Horn Co., Inc., A. C., Long Island City, N. Y.
Jet-Lube, Inc., Burbank, Calif.
Johns-Manville, New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
Key Co., East St. Louis, Ill.
Keystone Asphalt Products Co., Chicago, Ill.
Krehbiel Co., J. H., Chicago, Ill.
Lake Chemical Co., Chicago, Ill.
Lastik Products Co., Inc., Pittsburgh, Pa.
Macksons Co., New York, N. Y.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Montgomery Bros., San Francisco, Calif.
National Engineering Products, Inc., Washington, D. C.
Nebel Mfg. Co., Cleveland, O.
Parker Appliance Co., The, Cleveland, O.
Pecora Paint Co., Inc., Philadelphia, Pa.
Permatex Co., Inc., Brooklyn, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
Reilly Tar & Chemical Corp., Indianapolis, Ind.
Robinson Clay Product Co., The, Akron, O.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sauereisen Cements Co., Pittsburgh, Pa.
Saverite Engineering Co., Hoboken, N. J.
Smooth-On Mfg. Co., Jersey City, N. J.
Spring Packing Corp., Chicago, Ill.
Sulflo, Inc., Elizabeth, N. J.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.
Tube Turns Plastics, Inc., Louisville, Ky. (PVC pipe)
United States Stoneware Co., New York, N. Y.
Wilhelm Co., A., Reading, Pa.
X Laboratories, Inc., New York, N. Y.
X-Pando Corp., Long Island City, N. Y.

CEMENT, FURNACE

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Armstrong Co., Detroit, Mich.
Armstrong Cork Co., Lancaster, Pa.
Asbestos Asphalt Insulation Co., Chicago, Ill.
Babcock & Wilcox Co., New York, N. Y.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Clinton Metallic Paint Co., Clinton, N. Y. (Asbestos)
Continental Products Co., Euclid, O.
Foster Co., Benjamin, Philadelphia, Pa.
France Refractories Co., J. H., Snow Shoe, Pa.
Green Fire Brick Co., Mexico, Mo.
Hercules Chemical Co., Inc., New York, N. Y.
Johns-Manville, New York, N. Y.
Krehbiel Co., J. H., Chicago, Ill.
Lastik Products Co., Inc., Pittsburgh, Pa.
Nebel Mfg. Co., Cleveland, O.
Norton Co., Worcester, Mass.
Pecora Paint Co., Inc., Philadelphia, Pa.
Plastic Products Co., Detroit, Mich.
Plibrico Co., Chicago, Ill.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Refractory & Insulation Corp., New York, N. Y.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sall Mountain Co., Hamilton, O.
Sauereisen Cements Co., Pittsburgh, Pa.
Smooth-On Mfg. Co., Jersey City, N. J.
Standard Asbestos Mfg. Co., Chicago, Ill.

Standard Fuel Engineering Co., Detroit, Mich.
Taylor Sons Co., Charles, Cincinnati, O.
United States Stoneware Co., New York, N. Y.

CEMENT, INSULATING

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Asbestos Asphalt Insulation Co., Chicago, Ill.
Atlas Mineral Products Co., Mertztown, Pa.
Baldwin-Hill Co., Trenton, N. J. (mineral wool)
Bigelow-Liptak Corp., Detroit, Mich.
Bird-Archer Co., Philadelphia, Pa.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Eagle-Picher Co., Cincinnati, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Grant Wilson, Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
International Vermiculite Co., Girard, Ill.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa. (85 per cent magnesia)
Krehbiel Co., J. H., Chicago, Ill. (Asbestos, mineral wool)
Lee-Don, Inc., Pittsburgh, Pa.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Moore, Inc., Goodloe E., Danville, Ill.
Mundet Cork Corp., North Bergen, N. J.
Munn and Steele, Inc., South Boston, Mass.
National Engineering Products, Inc., Washington, D. C.
National Gypsum Co., Buffalo, N. Y.
Nelson Mfg. Co., B. F., Minneapolis, Minn.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
North American Asbestos Corp., Chicago, Ill.
Pabco Products Inc., San Francisco, Calif.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Plibrico Co., Chicago, Ill.
Poe Co., C. W., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Refractory & Insulation Corp., New York, N. Y.
Rex Clay Products Co., Detroit, Mich.
Ruberoid Co., New York, N. Y.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sall Mountain Co., Hamilton, O.
Sauereisen Cements Co., Pittsburgh, Pa.
Smith & Kanzler Corp., Linden, N. J.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill.
Standard Fuel Engineering Co., Detroit, Mich.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Mineral Wool Co., Stanhope, N. J.
Zonolite Co., Chicago, Ill.

CENTRIFUGAL PUMPS

See Pumps, Centrifugal

CHAIN DRIVES

See Drives, Chain

CHAMBERS, COMBUSTION, PREFORMED

Armstrong Cork Co., Lancaster, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Boston Machine Works Co., Lynn, Mass.
France Refractories Co., J. H., Snow Shoe, Pa.
Grant Wilson Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
Monogram Products Co., Inc., Philadelphia, Pa.
Oil Equipment Mfg. Corp., New Haven, Conn.
Preferred Utilities Mfg. Corp., New York, N. Y.
Refractory & Insulation Corp., New York, N. Y.
Rex Clay Products Co., Detroit, Mich.
S. O. S. Products Co., Inc., Brooklyn, N. Y.

CHAMBERS, TEST, CONTROLLED TEMPERATURE AND HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Anetsberger Brothers, Inc., Northbrook, Ill.
Baker Co., Inc., Maplewood, Me.
Drying Systems, Inc., Chicago, Ill.
Reco Products Div., Recony Corp., New York, N. Y.
Sub-Zero Freezer Co., Inc., Madison, Wis.
Tenney Engineering, Inc., Union, N. J.
York Corp., York, Pa.

CHANGERS, SPEED, HYDRAULIC COUPLING

American Blower Corp., Detroit, Mich.
CraneVeyor Corp., Los Angeles, Calif.
Reuland Electric Co., Alhambra, Calif. (combined electric motor and fluid drive coupling)
Twin Disc Clutch Co., Rockford, Ill.

CHANGERS, SPEED, MAGNETIC

Allis Co., Louis, The, Milwaukee, Wis.
Doerr Electric Corp., Cedarburg, Wis.
Electric Machinery Mfg. Co., Minneapolis, Minn.

CHANGERS, SPEED, MECHANICAL

Abart Gear & Machine Co., Chicago, Ill.
Allis Co., Louis, The, Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Flexible Coupling Co., Erie, Pa. (synchronizing friction clutch)
Chicago Die Casting Mfg. Co., Chicago, Ill.
Cleveland Worm & Gear Co., Cleveland, O.
DoAll Co., The, Des Plaines, Ill.
Dodge Mfg. Corp., Mishawaka, Ind.
Doerr Electric Corp., Cedarburg, Wis.
Driv-Way Lite Co., Denver, Colo.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Horton Mfg. Co., Inc., Minneapolis, Minn.
Lewellen Mfg. Co., Columbus, Ind.
Lima Electric Motor Co., The, Lima, O.
Link Belt Co., Chicago, Ill.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Master Electric Co., Dayton, O.
Morse Chain Co., Ithaca, N. Y.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Reeves Pulley Co., Columbus, Ind.
Reliance Electric & Engineering Co., Cleveland, O. (electrical & mechanical drives)
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Speed Selector Inc., Cleveland, O.
Standard Transmission Equipment Co., Pasadena, Calif.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Woods Sons Co., T. B., Chambersburg, Pa,
Worthington Corp., Harrison, N. J.

CHASERS, PIPE AND BOLT

Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Nye Tool Co., Chicago, Ill.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Toledo Pipe Threading Machine Co., Toledo, O.

CHASERS, THREADING DIE

Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Nye Tool Co., Chicago, Ill.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Toledo Pipe Threading Machine Co., Toledo, O.

CHECK VALVES

See Valves, Check

CHILLERS, WATER, FOR AIR CONDITIONING AND REFRIGERATION

Acme Industries, Inc., Jackson, Mich.
Alstrom Corp., New York, N. Y.
American Coils Co., Newark, N. J.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Armstrong Co., Richard M., Westchester, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., The, Elyria, O.
Brunner Mfg. Co., Utica, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Coleman Co., Inc., The, Wichita, Kans.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering, Inc., Somerville, Mass.
Davis Engineering Corp., Elizabeth, N. J.
Dole Refrigeratng Co., Chicago, Ill.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Frick Co., Waynesboro, Pa.
Graham Mfg. Co., Inc., New York, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heat-Exchangers, Inc., Chicago, Ill.
Heatron, Inc., York, Pa.
Heat-X Inc., The, Brewster, N. Y.
Howe Ice Machine Co., Chicago, Ill.
Kennard Corp., St. Louis, Mo.
King Zeero Co., The, Chicago, Ill.
Mayer Refrigerating Engineers, Inc., Lincoln Park, N. J.
Niagara Blower Co., New York, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Servel, Inc., Evansville, Ind.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Temprite Products Corp., Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Vilter Mfg. Co., The, Milwaukee, Wis.
Whitlock Mfg. Co., Hartford, Conn.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Yula Water Heaters, Inc., Bronx, N. Y.

CHILLERS, WATER, PACKAGED

See Compressors, Refrigerating, Combined with Condenser, Water Chiller, Piping Connections and Controls

CHLORINATORS, WATER

Aquatrol Ferr-X Corp., Clifton, N. J.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Culligan, Inc., Northbrook, Ill.
Fischer & Porter Co., Hatboro, Pa.
Wallace & Tiernan Inc., Belleville, N. J.

CIRCULATORS FOR HOT WATER HEATING SYSTEMS

Alliance Industries, Huntingden Valley, Pa.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Baseline Mfg. Co., Minneapolis, Minn.
Bell & Gossett Co., Morton Grove, Ill.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Columbus Steam Pump Works Co., Columbus.
Corley Co., Inc., The, Plainville, Conn. (magnetically driven)
Dayton Electric Mfg. Co., Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.
Econo Products Co., Inc., Div. of Viking Instruments Inc., East Haddam, Conn.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Hoffman Specialty Mfg. Corp., Indianapolis.

Kehm Corp., The, Chicago, Ill.
Kraissl Co., Inc., The, Hackensack, N. J.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Pumpenbay Brugg K. Rutschi, Brugg, Switzerland
Quality Specialty Co., Inc., Camden, N. J.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Weil Pump Co., Chicago, Ill.
White Flomatic Corp., Hoosick Falls, N. Y.

CLAMPS, BEAM, PIPE HANGING

Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Carpenter & Paterson, Inc., Cambridge, Mass.
Chicago Nipple Mfg. Co., Cicero, Ill.
Crawford Co., Chicago, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Frick Co., Waynesboro, Pa.
Gateway Engineering Co., Chicago, Ill.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Providence, R. I.
Hupp Corp., Globe Stamping Div., Cleveland, O.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Moore, Inc., Goodloe E., Danville, Ill.
Mult-A-Frame Div., Ainsworth Mfg. Corp., Detroit, Mich.
National Valve & Mfg. Co., Pittsburgh, Pa.
Paine Co., Addison, Ill.
Rockwood Sprinkler Co., Worcester, Mass.
Steel City Electric Co., Pittsburgh, Pa.
Unistrut Products Co., Chicago, Ill.
Walworth Co., New York, N. Y.

CLAMPS, HOSE

Allen Mfg. Co., W. D., Chicago, Ill.
Breeze Corporations, Inc., Union, N. J.
Chicago Pneumatic Tool Co., New York, N. Y.
Circle Clamp Corp., New York, N. Y.
Continental Rubber Wks., Erie, Pa.
Crane Co., Chicago, Ill.
Flexible Tubing Corp., Guilford, Conn.
Goodall Rubber Co., Trenton, N. J.
Ideal Corp., Brooklyn, N. Y.
Manufacturers Corp., Mansfield, O.
Marman Products Co., Inc., A Subsidiary of Aeroquip Corp., Los Angeles, Calif.
Punch-Lok Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Richland Co., Mansfield, O.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Thor Power Tool Co., Aurora, Ill.
Tinnerman Products, Inc., Cleveland, O.
Wittek Manufacturing Co., Chicago, Ill.

CLAMPS, PIPE REPAIR

Adams Pipe Repair Products, El Monte, Calif.
Chelsea Metal Stamping Co., New York, N. Y.
Chicago Specialty Mfg. Co., Chicago, Ill.
Clow & Sons, James B., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Ideal Corp., Brooklyn, N. Y.
Inner-Tite Div., Yara Engineering Corp., Elizabeth, N. J.
Ludlow Valve Mfg. Co., Inc., The, Rensselaer Valve Div., Troy, N. Y.
Marman Products Co., Inc., A Subsidiary of Aeroquip Corp., Los Angeles, Calif.
Morris Coupling & Clamp Co., Kittanning, Pa.
Paine Co., The, Addison, Ill.
Pipe Line Development Co., Cleveland, O.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
Skinner Co., M. B., South Bend, Ind.
Yarnall-Waring Co., Philadelphia, Pa.

CLAMPS, PIPE, WELDING

Adjustable Clamp Co., Chicago, Ill.
Albert Pipe Supply Co., Brooklyn, N. Y.
Atlas Welding Accessories Co., Ferndale, Mich.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Detroit Stamping Co., Detroit, Mich.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Jewel Mfg. Co., St. Paul, Minn.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Trindl Products, Ltd., Chicago, Ill.
Williams & Co., J. H., Buffalo, N. Y.

CLEANERS, AIR, ELECTRICAL

Air-Maze Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
Dollinger Corp., Rochester, N. Y.
Electro-Air Cleaner Co., Pittsburgh, Pa.
Radex Corp., Chicago, Ill.
Raytheon Mfg. Co., Waltham, Mass.
Trion, Inc., McKees Rocks, Pa.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wilson Engineering Corp., Chicago, Ill.

CLEANERS, PIPE LINE, ELECTRICALLY DRIVEN

Ken-Way Corp., Sparta, Wis.
Spartan Tool Co., Chicago, Ill.

CLEANERS, TUBE

Arcee Products, Pawtucket, R. I. (copper fitting cleaning tool)
Chesterton Co., A. W., Everett, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Elliott Co., Jeannette, Pa.
Osborn Mfg. Co., Cleveland, O.
Mill-Rose Co., Cleveland, O.
Perfection Grate & Stoker Co., Springfield, Mass.
Pierce Co., Wm. B., The, Buffalo, N. Y.
Pilley Brush Co., Fort Madison, Ia.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Spencer Turbine Co., Hartford, Conn.
Wilson, Inc., Thomas C., Long Island City, N. Y.
York Corp., York, Pa.

CLEANERS, VACUUM, FOR BOILERS

Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Empire Chemical Products Co., Newark, N. J.
Ideal Industries, Inc., Sycamore, Ill.
National Super Service Co., Toledo, O.
Pullman Vacuum Cleaner Co., Boston, Mass.
Spencer Turbine Co., Hartford, Conn.

CLEANING COMPOUNDS

See Compounds, Cleaning, Pipe Coil and Condenser

CLEANING COMPOUNDS, AIR FILTER

See Compounds, Cleaning, Air Filter

CLEANING MACHINES, PIPE

See Machines, Pipe Cleaning; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

CLOTH, TREATED, FOR DUST COLLECTORS

Canvas Products Co., St. Louis, Mo.
Menardi & Co., El Segundo, Calif.

COAL BURNERS

See Burners, Pulverized Coal; Stokers

COAL CONVEYORS

See Conveyors, Coal and Ash

COATINGS, PROTECTIVE, FOR METALS

Allied Porcenell, Inc., Waukegan, Ill. (vitreous enamel coatings)
Alrose Chemical Co., Providence, R. I.
Amercoat Corporation, South Gate, Calif.
American Chemical Paint Co., Ambler, Pa. (rust proofing chemicals)
American Hard Rubber Co., New York, N. Y. (rubber and plastic)
American Solder & Flux Co., Philadelphia, Pa. (Galvanizing powder)
Armstrong Cork Co., Lancaster, Pa. (asphalt for weather & low temperatures)
Atlas Mineral Products Co., Mertztown, Pa. (plastic)
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (Pitchbase and asphalt-base)
Bart Mfg. Corp., Belleville, N. J.
Blue Ridge Talc Co., Inc., Henry, Va.
Brooklyn Varnish Mfg. Co., Brooklyn, N. Y.
Cabot Inc., Samuel, Boston, Mass. (Bituminous black paint)
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carboline Co., The, St. Louis, Mo. (corrosion resisting)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asphalt and aluminum paints for roofs)
Chemical Coatings & Engineering Co., Edgemont, Pa.
Chemical Solvent Co., Birmingham, Ala. (liquid)
Condenser Service & Engineering Co., Inc., Hoboken, N. J. (Metal spray)
Continental Products Co., Euclid, O. (paint)
Cordo Chemical Corp., Norwalk, Conn.
Corite Products, Inc., Chicago, Ill. (plastic)
Corrosion Control Co., Inc., New York, N. Y.
Corrosite Div., Reliance Paint Co., Brooklyn, N. Y. (vinyl plastic)
Corro-Vent, Inc., Cincinnati, O. (plastic)
Dampney Co. of America, Boston, Mass.
Dearborn Chemical Co., Chicago, Ill. (Rust preventive)
Debevoise Co., The, Brooklyn, N. Y.
Dow Corning Corp., Midland, Mich.
du Pont de Nemours & Co. (Inc.), E. I., Finishes Div., Wilmington, Del.
Eagle-Picher Co., Cincinnati, O. (Waterproof insulating, red lead and blue lead)
Elraco Engineering Co., Los Angeles, Calif. (interior tank paint)
Emjay Maintenance Engineers, Rutherford, N. J.
Flintkote Co., The, New York, N. Y. (Asphalt emulsions)
Flexrock Co., Philadelphia, Pa.
Foster Co., Benjamin, Philadelphia, Pa.
France Refractories, Co., J. H., Snow Shoe, Pa. (cast iron & steel)
Gates Engineering Co., Wilmington, Del.
Glidden Co., The, Cleveland, O.
Goodall Rubber Co., Trenton, N. J. (liquid Neoprane)
Goodrich Co., B. F., Akron, O.
Haering & Co., Inc., D. W., San Antonio, Texas. (Drying and non-drying)
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Harco Corp., Bedford, O. (corrosion protection for underground piping, process tanks, storage tanks, and radiant heating piping)
Heresite & Chemical Co., Manitowoc, Wis. (Synthetic rubber and phenolic)
Hill, Hubbell & Co., Cleveland, O. (coating and wrapping for steel pipe)
Horn Co., Inc., A. C., Long Island City, N. Y.
Houghton & Co., E. F., Philadelphia, Pa.
Industrial Metal Protectives, Inc., Dayton, O.
Insul-Mastic Corp., Summit, Ill. (asphaltic & plastic)
Interchemical Corp., Finishes Div., Newark, N. J.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Kellogg Co., M. W., The, New York, N. Y. (Heat resisting)
Knight, Maurice A., Akron, O. (Vinyl plastic base)
Koppers Co., Inc., Pittsburgh, Pa. (coal tar)
Lastik Products Co., Inc., Pittsburgh, Pa.
Lithcote Corp., Melrose Park, Ill. (baked)
Maas & Waldstein Co., Newark, N. J.
Master Mechanics Co., Cleveland, O.
Metalweld, Inc., Protective Coatings Div., Philadelphia, Pa. (linings for hot water tanks)
Midland Paint & Varnish Co., Cleveland, O.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., Detroit, Mich. (Sound dampening and insulating types as well as for protection against corrosion)
Miracle Adhesives, Corp., New York, N. Y.
Moore & Co., Samuel, Mantau, O. (plastic)
Mortell Co., J. W., Kankakee, Ill. (Asphalt)
National Lead Co., New York, N. Y. (Red lead)
National Pipe Coatings, Inc., Huntington Park, Calif.
Nebel Mfg. Co., Cleveland, O.
Nelson Mfg. Co., B. F., Minneapolis, Minn.
Novelty Steam Boiler Works, Inc., Baltimore, Md.

Oakite Products, Inc., New York, N. Y. (phosphate)
Octagon Process, Inc., Staten Island, N. Y. (rust preventive oils, rust-proofing compounds)
Ohmlac Paint & Refining Co., Inc., New York, N. Y. (Acid resistant, heat resistant)
Penn Galvanizing Co., Philadelphia, Pa. (Galvanizing)
Pennsylvania Salt Mfg. Co., Philadelphia, Pa. (chlorinated hydrocarbon base, and liquid neoprene base)
Perolin Co., Inc., Chicago, Ill.
Pittsburgh Plate Glass Co., Pittsburgh, Pa. (Paint, varnish, lacquer)
Poe Co., C. W., The, Cleveland, O.
Polyken Products, Dept. of the Kendall Co., Chicago, Ill. (tape, plastic)
Porce-Lin Tank Lining Co., Detroit, Mich.
Presstite Engineering Co., St. Louis, Mo.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Reilly Tar & Chemical Corp., Indianapolis, Ind. (Coal tar base)
Robertson Co., H. H., Pittsburgh, Pa.
Rotometals, San Francisco, Calif. (galvanizing repair stick)
Rubber & Plastics Compound Co., New York, N. Y. (anticorrosive coating)
Rust-Oleum Corp., Evanston, Ill.
Saran Lined Pipe Co., Ferndale, Mich.
Saverite Engineering Co., Hoboken, N. J. (Tank coatings, rust preventive)
Sherwin-Williams Co., The, Cleveland, O.
Sonneborn Sons, Inc., L., New York, N. Y.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga. (Metallic paint)
Special Chemicals Corp., Ossining, N. Y. (Aluminum paint)
Standard Oil Co. of California, San Francisco, Calif.
Steelcote Mfg. Co., St. Louis, Mo.
Stewart-Warner Corp., Heating Div., Indianapolis, Ind. (ceramic)
Surface Chemicals, Inc., McKees Rocks, Pa. (plastic)
Tapecoat Co., The, Evanston, Ill. (coal tar protective coating in tape form for pipe and fittings, insulated pipe underground and above ground)
Thompson and Co., Oakmont, Pa.
Tropical Paint Co., Cleveland, O. (priming paint for iron & zinc)
Truscon Laboratories, Detroit, Mich. (alkyd and epoxy resin)
Turco Products, Inc., Los Angeles, Calif.
United Chromium Div., Metal & Thermit Corp., New York, N. Y. (Chemical resisting organic coatings)
United States Stoneware Co., Plastics & Synthetics Div., Akron, O. (vinyls)
United States Stoneware Co., New York, N. Y. (Corrosion resistant)
Vimasco Corp., Charleston, W. Va. (vinyl)
Watson-Standard Co., Pittsburgh, Pa.
Wilbur & Williams Co., Brighton, Mass.
Wilhelm Co., A., Reading, Pa.
Wolfe-Kote Co., Inc., Sheboygan, Wis.

COCKS, BOILER GAGE

Bordo Co., Inc., L. J., Glenside, Pa.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Ernst Water Column & Gauge Co., Livingston, N. J.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Skokie, Ill.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Nason Co., Clarkston, Mich.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
Reliance Gauge Column Co., Cleveland, O.
Shank Co., Cyrus, Chicago, Ill.
Strahman Valves, Inc., New York, N. Y.
Swift Lubricator Co., The, Elmira, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.
Wright-Austin Co., Detroit, Mich.

COILS, CONDENSATION

Albert Pipe Supply Co., Brooklyn, N. Y.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
General Ceramics Corp., Keasbey, N. J. (ceramic)
General Fittings Co., East Greenwich, R. I.
Heatron, Inc., York, Pa.
Lewis & Co., Joseph E., Baltimore, Md.
Parker Appliance Co., The, Cleveland, O.
Trane Co., The, La Crosse, Wis.
Vilter Mfg. Co., The, Milwaukee, Wis.
Yula Water Heaters, Inc., Bronx, N. Y.

COILS, FINNED

See Surface, Cooling; Surface, Heating

COILS, FOR HOT WATER STORAGE TANKS

Adams Co., The, Dubuque, Ia.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Alstrom Corp., New York, N. Y.
American Cooling Tower Co., Kansas City, Mo.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Beltran Associates, Inc., Brooklyn, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Downingtown Iron Works, Downingtown, Pa.
General Fittings Co., East Greenwich, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Kewanee-Ross Corp., Kewanee, Ill.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
National Pipe Bending Co., New Haven, Conn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Pittsburgh Pipe Coil & Bending Co., Etna, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Rempe Co., Chicago, Ill.
Republic Products Co., Philadelphia, Pa.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Tranter Mfg., Inc., Lansing, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters, Inc., Bronx, N. Y.

COILS AND PANELS, RADIANT HEATING AND COOLING, PREFABRICATED

Albert Pipe Supply Co., Brooklyn, N. Y.
Alstrom Corp., New York, N. Y.
American Brass Co., Waterbury, Conn.
Atlantic Pipe Bending and Fabricating Corp., Wood-Ridge, N. J.
Burgess-Manning Co., Chicago, Ill. (also for radiant cooling)
Capitol Mfg. & Supply Co., Columbus, O.
Clow & Sons, James B., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Elmwood, Conn.
Crittall Radiant Heating, Inc., Richard, New York, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Even-Ray Co., Inc., Newark, N. J.
Fricke, Fred J., Albuquerque, N. M.
Heat & Power Corp., Baltimore, Md.
Hi-Flow Products, Inc., Copiague, N. Y.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
National Pipe Bending Co., New Haven, Conn.
Nesbitt, Inc., John J., Philadelphia, Pa.
Olin Mathieson Chemical Corp., Metals Div., New York, N. Y. (roll bonded metal panels incorporating fluid passages)
Price Brothers, Dayton, O. (concrete slabs with openings for air travel or for hot water coils)
Radiant Heat and Cooling Co., Santa Clara, Calif.
Radiant Panel Mfg. Co., Torrington, Conn.
Reflectotherm, Inc., Cincinnati, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Simplex Ceiling Corp., New York, N. Y.
T & H Engineering Co., Little Ferry, N. J. (hammer and holding rig for installing ceiling heating coils)
Tranter Mfg. Inc., Lansing, Mich.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Wallace Supplies Mfg. Co., Chicago, Ill.

COILS, PIPE

Albert Pipe & Supply Co., Brooklyn, N. Y.
American Cooling Towers Co., Kansas City, Mo.
Atlantic Pipe Bending and Fabricating Corp., Wood-Ridge, N. J.
B & M Mfg. Co., East Orange, N. J.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Nipple Mfg. Co., Cicero, Ill.
Clow & Sons, James B., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Elmwood, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Corning Glass Works, Corning, N. Y.
Crane Co., Chicago, Ill.
Davis Engineering Corp., Elizabeth, N. J.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y. (lead, lead covered, and lead alloy)
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Flori Pipe Co., The, St. Louis, Mo.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Harris & Co., Arthur, Chicago, Ill.
Heil Process Equipment Corp., Cleveland, O. (Impervious Graphite)
Howe Ice Machine Co., Chicago, Ill.
Kopperman & Sons, Joseph, Philadelphia, Pa.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead covered)
Lewis & Co., Joseph E., Baltimore, Md.
Lumsden & Van Stone, Div. of Midwest Piping Co., Inc., South Boston, Mass.
Marlo Coil Co., St. Louis, Mo.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Philadelphia Pipe Bending Co., Philadelphia.
Pittsburgh Pipe Coil & Bending Co., Etna, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Rempe Co., Chicago, Ill.
Reynolds Mfg. Co., Inc., Springfield, Mo.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Shaw-Kendall Engineering Co., Toledo, O.
Tranter Mfg., Inc., Lansing, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Wallace Supplies Mfg. Co., Chicago, Ill.
Western Piping & Engineering Co., Inc., San Francisco, Calif.
Whitlock Mfg. Co., Hartford, Conn.
York Corp., York, Pa.

COLLECTION, DUST AND FUME, ULTRASONIC

Ultrasonic Corp., Cambridge, Mass.

COLLECTORS, DUST

Aerotec Corp., The, Greenwich, Conn. (mechanical and electrical)
Aget-Detroit Co., Ann Arbor, Mich.
Allington & Curtis Mfg. Co., Saginaw, Mich. (centrifugal & bag)
American Air Filter Co., Inc., Louisville, Ky.
American Blow Pipe Co., Chicago, Ill. (shavings and sawdust) (buffing and polishing)
American Blower Corp., Detroit, Mich.
Baker Co., Inc., Maplewood, Me. (portable)

Banister Co., Inc., A. W., Cambridge, Mass. (centrifugal-dry and wet)
Blower Application Co., Milwaukee, Wis.
Bubar Dust Systems, Old Lyme, Conn. (mechanical)
Buell Engineering Co., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y. (wet & dry)
Carolina Blower Co., Inc., Greensboro, N. C.
Centri-Spray Corp., Livonia, Mich. (Wet type)
Chicago Blower Corp., Franklin Park, Ill. (centrifugal)
Cincinnati Electrical Tool Co., The, Cincinnati, O. (self contained)
Clark Dust Control Co., Chicago, Ill.
Columbian Steel Tank Co., Kansas City, Mo.
Day Co., The, Minneapolis, Minn.
Ducon Co., The, Mineola, N. Y. (Cyclone, centrifugal wash, and bag type)
Dust Filter Co., Chicago, Ill.
Dust Suppression & Engineering Co., Lake Orion, Mich.
Dustex Corp., Buffalo, N. Y. (mechanical)
Farr Co., Los Angeles, Calif. (cyclonic)
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Goethel Sheet Metal Wks., Inc., Alfred, Milwaukee, Wis.
Green Fuel Economizer Co., Beacon, N. Y. (dry type)
Griffin & Co., Inc., Louisville, Ky.
Kirk & Blum Mfg. Co., Cincinnati, O.
Koppers Company, Inc., Metal Products Div., Baltimore, Md. (electrostatic)
Lumm Co., A. H., Toledo, O.
Mahon Co., R. C., The, Detroit, Mich. (dry inertia, air washers, fog filters)
Johnson March, Philadelphia, Pa.
National Dust Collector Corp., Chicago, Ill. (wet type)
Newcomb-Detroit Co., Detroit, Mich. (recirculating water type)
Northern Blower Co., Cleveland, O.
Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I. (bag type)
Pangborn Corp., Hagerstown, Md. (cloth filter)
Peters-Dalton, Inc., Detroit, Mich.
Prat-Daniel Corp., South Norwalk, Conn.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Ruemelin Mfg. Co., Milwaukee, Wis.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Schmieg Industries, Detroit, Mich. (wet type)
Schneible Co., Claude B., Detroit, Mich. (wet type)
Sly Mfg. Co., W. W., Cleveland, O.
Spencer Turbine Co., Hartford, Conn.
Sprout-Waldron & Co., Muncy, Pa.
Torit Mfg. Co., St. Paul, Minn. (cloth filter and centrifugal separator)
Wagner Awning & Mfg. Co., Cleveland, O. (Dust recovery bags)
Western Blower Co., Seattle, Wash.
Western Precipitation Corp., Los Angeles, Calif.
Wheelabrator Corp., Mishawaka, Ind. (cloth-tube type)
Winkler & Sons, Inc., A. E., Milwaukee, Wis.
Young & Bertke Co., Cincinnati, O. (cyclone type)

COLORIMETERS

American Instrument Co., Inc., Silver Spring, Md.
Bausch & Lomb Optical Co., Rochester 2, N. Y.
Ellison Draft Gage Co., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Will Corp., Rochester, N. Y.

COMBUSTION CHAMBERS

See Chambers, Combustion, Preformed

COMBUSTION CONTROL

See Controls, Draft, Barometric; Regulators, Draft, Combustion; Systems, Combustion Control

COMBUSTION RECORDERS

See Recorders, Carbon Dioxide

COMBUSTION TESTING KITS

See Kits, Combustion Testing; Analyzers, Carbon Dioxide, Portable; Testers, Smoke

COMPOUNDS, AIR FRESHENING

Aireactor Corp., New York, N. Y.
Airkem, Inc., New York, N. Y.
Ampion Corp., Long Island City, N. Y.
Barnebey-Cheney Co., Columbus, O.
Carbide and Carbon Chemicals Co., A Division of Union Carbide and Carbon Corp., New York, N. Y.
Lord & Clark Co., Inc., Boston, Mass.

COMPOUNDS, ANTI-FREEZE, FOR SNOW MELTING COILS

Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Dow Chemical Co., The, Midland, Mich.
duPont deNemours & Co., E. I., Grasselli Chemicals Dept., Wilmington, Del.
du Pont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del.
Socony-Mobil Oil Co., Inc., New York, N. Y.

COMPOUNDS, BOILER CLEANING

Agava Products, Inc., Jersey City, N. J.
Agnew & Tomlinson, Long Island City, N. Y.
American Chemical Paint Co., Ambler, Pa.
American K. A. T. Corp., Garwood, N. J.
American Sand-Banum Co., Inc., Freeport, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Calgon, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Continental Products Co., Euclid, O.
Dearborn Chemical Co., Chicago, Ill.
Dowell Inc., Tulsa, Okla.
Drew & Co., Inc., E. F., New York, N. Y.
duPont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington, Del.
Elraco Engineering Co., Los Angeles, Calif.
Garman Co., Inc., The, St. Louis, Mo. (also for pumps, condensers, etc.)
Haering & Co., Inc., D. W., San Antonio, Tex.
Hagan Corp., Pittsburgh, Pa.
Hercules Chemical Co., Inc., New York, N. Y.
Houghton & Co., E. F., Philadelphia, Pa.
Kenite Laboratory, Inc., Madison, N. J.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Krehbiel Co., J. H., Chicago, Ill.
McMillan Industrial Supplies, C. C., Portland, Ore.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Moreheat Distribution, Inc., Cincinnati, O.
North American Fibre Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Octagon Process, Inc., Staten Island, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Permutit Co., New York, N. Y.
Perolin Co., Inc., Chicago, Ill.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Saverite Engineering Co., Hoboken, N. J.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond Co., Cleveland, O.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Warren Refining & Chemical Co., The, Cleveland, O.
Water Control Engineering Co., Kansas City, Mo.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Co. of America, Pittsburgh, Pa.
Western Chemical Co., Kansas City, Mo.
X Laboratories, Inc., New York, N. Y.

COMPOUNDS, BOILER AND RADIATOR SEALING

Ampion Corp., Long Island City, N. Y.
Arco Co., The, Cleveland, O.
Black & White Chemical Co., New York, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Cannon Chemical Co., Inc., Cambridge, Mass.
Chemical Solvent Co., Birmingham, Ala.
Eagle-Picher Co., Cincinnati, O.
Hampton-Cross Co., The, Louisville, Ky.
Hercules Chemical Co., Inc., New York.
Johns-Manville, New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
Krehbiel Co., J. H., Chicago, Ill.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
National Engineering Products, Inc., Washington, D. C.
Quigley Co., Inc., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sulflo, Inc., Elizabeth, N. J.
X Laboratories, Inc., New York, N. Y.

COMPOUNDS, CLEANING, AIR FILTER

Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York, N. Y.
Cuno Engineering Corp., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Homestead Valve Mfg. Co. Coraopolis, Pa.
Madden Corp., Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Montgomery Chemical Co., Jenkintown, Pa.
National Aniline Div., Allied Chemical & Dye Corp., New York, N. Y.
Oakite Products, Inc., New York, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Trion, Inc., McKees Rocks, Pa.
Turco Products, Inc., Los Angeles, Calif.

COMPOUNDS, CLEANING, PIPE COIL AND CONDENSER

Agava Products, Inc., Jersey City, N. J.
American Chemical Paint Co., Ambler, Pa.
American Sand-Banum Co., Inc., Freeport, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Blue Seal Chemical Co., Roselle Park, N. J.
Calgon, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carolina Aniline & Extract Co., Inc., Charlotte, N. C.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Dearborn Chemical Co., Chicago, Ill.
Dowell, Inc., Tulsa, Okla.
Elraco Engineering Co., Los Angeles, Calif.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hercules Chemicals Co., Inc., New York, N. Y.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
National Aniline Div., Allied Chemical & Dye Corp., New York, N. Y.
North American Fibre Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Octagon Process, Inc., Staten Island, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Perolin Co., Inc., Chicago, Ill.
Petroleum Solvents Corp., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Turco Products, Inc., Los Angeles, Calif.
Water Control Engineering Co., Kansas City, Mo.
Water Treatment Co. of America, Pittsburgh, Pa.
Western Chemical Co., Kansas City, Mo.

COMPOUNDS, WELDING

Allen Co., Inc., L. B., Chicago, Ill.
Allied Weld-Craft, Inc., Indianapolis, Ind.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American Solder & Flux Co., Philadelphia,

Pa.
Atlas Welding Accessories Co., Ferndale, Mich.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Metal & Thermit Corp., New York, N. Y.
Midland Paint & Varnish Co., Cleveland, O.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif.
Modern Engineering Co., St. Louis, Mo.
Presstite Engineering Co., St. Louis, Mo.
Sight Feed Generator Co., West Alexandria, O.
Solar Aircraft Co., San Diego, Calif.
Special Chemicals Corp., Ossining, N. Y.
Thompson and Co., Oakmont, Pa.
Turco Products, Inc., Los Angeles, Calif.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.
Wolfe-Kote Co., Inc., Sheboygan, Wis.

COMPRESSED AIR DEHUMIDIFIERS

See Dehumidifiers for Compressed Air

COMPRESSED AIR MOTORS

See Motors, Compressed Air Powered

COMPRESSION PIPE FITTINGS

See Fittings, Pipe, Compression

COMPRESSOR BASES

See Bases and Pads, Vibration Isolating

COMPRESSOR PARTS

See Parts, Refrigerating Compressor

COMPRESSOR SEALS

See Seals, Terminal, for Compressors

COMPRESSORS, AIR

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Beach-Russ Co., New York, N. Y.
Binks Mfg. Co., Chicago, Ill.
Brunner Mfg. Co., Utica, N. Y.
Burgess-Thomas Co., Bloomfield, N. J.
Bury Compressor Co., Erie, Pa.
Carrier Corp., Syracuse, N. Y.
Chicago Pneumatic Tool Co., New York, N. Y.
Clark Bros. Co., Inc., Div. of Dresser Industries, Olean, N. Y.
Cleaver-Brooks Co., Milwaukee, Wis.
Cooper-Bessemer Corp., Mt. Vernon, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis.
Davey Compressor Co., Kent, O.
DeVilbiss Co., The, Toledo, O.
Essick Mfg. Co., Los Angeles, Calif.
Fuller Co., Catasaqua, Pa.
Gardner-Denver Co., Quincy, Ill.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gray Co., Inc., Minneapolis, Minn.
Haskel Engineering & Supply Co., Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Joy Mfg. Co., Pittsburgh, Pa.
Kraissl Co., Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Lima Electric Motor Co., The, Lima, O.
Lynch Corp., Anderson, Ind.
M & E Mfg. Co., Indianapolis, Ind.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Multiplex Mfg. Co., Berwick, Pa.
Nash Engineering Co., South Norwalk, Conn.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Roots-Connersville Blower Div., Connersville, Ind.
Schramm, Inc., West Chester, Pa.
Spencer Turbine Co., Hartford, Conn.
Union Steam Pump Co., Battle Creek, Mich.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Wayne Pump Co., Salisbury, Md.
Wilson Co., K. R., Arcade, N. Y.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

COMPRESSORS, REFRIGERATING, CENTRIFUGAL

American Blower Corp., Detroit, Mich.
Carrier Corp., Syracuse, N. Y. (Carrene)
Harv-O-Metic Co., Los Angeles, Calif.
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Trane Co., The, LaCrosse, Wis.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

COMPRESSORS, REFRIGERATING, COMBINED WITH CONDENSER, WATER CHILLER, PIPING CONNECTIONS, AND CONTROLS

Acme Industries, Inc., Jackson, Mich.
American Motors Corp., Kelvinator Div., Detroit, Mich.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Brown Products Co., Forrest Hills, N. Y.
Brunner Mfg. Co., Utica, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Diceler Div. of General Machine & Mfg. Co., Berwick, Pa.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Frick Co., Waynesboro, Pa.
Heat-X, Inc., Brewster, N. Y.
Lehigh Mfg. Co., Div. of Lehigh Inc., Lancaster, Pa.
Mayer Refrigerating Eng., Inc., Lincoln Park, N. J.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Primor Products, Inc., Adrian, Mich.
Schnacke, Inc., Evansville, Ind.
Tecumseh Products Co., Tecumseh, Mich.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., The, Milwaukee, Wis.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

COMPRESSORS, REFRIGERATING, RECIPROCATING

American Motors Corp., Kelvinator Div., Detroit, Mich.
Brunner Co., Gainesville, Ga.
Brunner Mfg. Co., Utica, N. Y. (Methyl chloride, "Freon," sulphur dioxide)
Carrier Corp., Syracuse, N. Y. ("Freon")
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O. (Radial)
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Copeland Refrigeration Corp., Sidney, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Diceler Div. of General Machine & Mfg. Co., Berwick, Pa.
Frick Co., Waynesboro, Pa. (Ammonia, "Freon")
Frigidaire Div., General Motors Corp., Dayton, O.
Ingersoll-Rand Co., New York, N. Y.
Lehigh Mfg. Co., Div. of Lehigh Inc., Lancaster, Pa.
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Multiplex Mfg. Co., Berwick, Pa.
Ready-Power Co., The, Detroit, Mich. (radial unit driven by direct-connected internal combustion engine)
Reliance Refrigerating Machine Co., Chicago, Ill. ("Freon," methyl chloride, ammonia)
Reynolds Mfg. Co., Inc., Springfield, Mo.
Schnacke, Inc., Evansville, Ind.
Servel, Inc., Evansville, Ind.
Stewart Ice Machine Co., Pomona, Calif.
Tecumseh Products Co., Tecumseh, Mich.
Trane Co., The, LaCrosse, Wis.
U. S. Thermo Control Co., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis. ("Freon" ammonia)
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa. (Carbon dioxide, ammonia, "Freon")

COMPRESSORS, REFRIGERATING, STEAM JET

Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engrg. Co., Inc., New York, N. Y.
Graham Mfg. Co., Inc., New York, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Kewanee-Ross Corp., Kewanee, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

COMPRESSORS, STEAM BOOSTER

Bury Compressor Co., Erie, Pa.
Graham Mfg. Co., Inc., New York, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Worthington Corp., Harrison, N. J.

CONCRETE, INSULATING, FOR UNDERGROUND PIPING

Beltran Associates, Inc., Brooklyn, N. Y.
Dockstader, Inc., S. E., Washington, D. C.
Munn and Steele, Inc., South Boston, Mass.
Zonolite Co., Chicago, Ill.

CONDENSATE DISPOSAL UNITS

See Pumps, Condensate, For Removing Condensation From Air Conditioning Units

CONDENSATE RETURN

See Pumps, Condensation Return; Systems, Condensate Return

CONDENSATION METERS

See Meters, Condensation

CONDENSATION PUMPS

See Pumps, Condensation

CONDENSER TUBES

See Tubes, Condenser

CONDENSERS, REFRIGERATING, AIR COOLED

American Standard, Air Conditioning Div., New York, N. Y. (2 and 3 ton size)
Armstrong Furnace Co., Columbus O. (2 & 3 ton)
Betz Corp., Hammond, Ind. (1-10 ton)
Blazer & Son, M., Passaic, N. J. (to 100 tons)
Brunner Mfg. Co., Utica, N. Y. (2 3, 5, 7½, 10 ton)
Bush Mfg. Co., West Hartford, Conn.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Deansteel Products Co., San Antonio, Tex. (3, 5, 7½ ton)
Domestic Mfg. Corp., Bellaire, Tex.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif. (1 to 10 tons)
Fedders-Quigan Corp., Buffalo, N. Y.
General Air Conditioning Corp., Los Angeles, Calif. (2, 3 ton)
Halstead & Mitchell, Pittsburgh, Pa. (5 to 20 tons)
Heat-Exchangers, Inc., Chicago, Ill. (up to 10 ton)
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga. (2-7½ tons)
Lennox Industries, Inc., Marshalltown, Ia. (2, 3, 5 ton)
Marlo Coil Co., St. Louis, Mo. (1 to 20 tons)
McCord Corp., Detroit, Mich. (to 3 HP)
McQuay, Inc., Minneapolis, Minn. (2 to 15 HP)
Peerless of America, Inc., Chicago, Ill.
Perfection Industries Div., Hupp Corp., Cleveland, O. (2, 3, 5 ton)
Refrigeration Appliances, Inc., Chicago, Ill. (2 to 10 tons)
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y. (up to 7½ hp)
Rome-Turney Radiator Co., Rome, N. Y.
Round Oak Co., Inc., Dowagiac, Mich. (1½-3 HP)
Superior Radiator Corp., Minneapolis, Minn. (½ thru 7½ HP)

Tenney Engineering, Inc., Union, N. J.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Minneapolis, Minn. (35.7½ HP)
Vilter Mfg. Co., The, Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whirlpool Seegar Corp., Evansville, Ind.
Witt Co., A.H., Los Angeles, Calif.
Worthington Corp., Harrison, N. J.

CONDENSERS, REFRIGERATING, EVAPORATIVE

Acme Industries, Inc., Jackson, Mich.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Blaw Knox Co., Buflovak Equipment Div., Buffalo, N. Y.
Blazer & Son, M., Passaic, N. J.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y. ("Freon," ammonia)
Chrysler Airtemp, Div. of Chrylser Corp., Dayton, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cobell Industries, Ft. Worth, Tex.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Frick Co., Waynesboro, Pa.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Harry Cooling Towers, Inc., New York, N. Y.
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Niagara Blower Co., New York, N. Y.
Perfection Industries Div., Hupp Corp., Cleveland, O. (2, 3, 4, 5, 6 ton)
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Servel, Inc., Electric Refrigeration Div., Evansville, Ind.
Silco Products, Inc., Minneapolis, Minn.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Yorktowne Machine Co., York, Pa.

CONDENSERS, REFRIGERATING, SHELL AND COIL

Acme Industries, Inc., Jackson, Mich.
Autorad Inc., Chicago, Ill.
Brown Fintube Co., The, Elyria, O.
Carrier Corp., Syracuse, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Davis Engineering Corp., Elizabeth, N. J.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Edwards Engineering Corp., Pompton Plains, N. J.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
General Fittings Co., East Greenwich, R. I.
Halstead & Mitchell, Pittsburgh, Pa. (Double tube)
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Heil Process Equipment Corp., Cleveland, O.
Howe Ice Machine Co., Chicago, Ill.
Lehigh Mfg. Co., Div. of Lehigh Inc., Lancaster, Pa.
Nooter Corp., St. Louis, Mo.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitlock Mfg. Co., Hartford, Conn.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

CONDENSERS, REFRIGERATING, SHELL AND TUBE

Acme Industries, Inc., Jackson, Mich.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Andale Co., Philadelphia, Pa.
Autorad Inc., Chicago, Ill.
Armstrong Co., Richard M., Westchester, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Biggs Boiler Works Co., E., Akron, O.
Brown Fintube Co., The, Elyria, O.
Buxton Mfg. Co., Dover, N. J.
Carrier Corp., Syracuse, N. Y. (Carrene)
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Davis Engineering Corp., Elizabeth, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Frick Co., Waynesboro, Pa.
General Heaters & Regulators Co., East Chicago, Ind.
Howe Ice Machine Co., Chicago, Ill.
Kewanee-Ross Corp., Kewanee, Ill.
Manning & Lewis Engineering Co., Newark, N. J.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nooter Corp., St. Louis, Mo.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Reco Products Div., Recony Corp., New York.
Reliance Refrigerating Machine Co., Chicago, Ill.
Reynolds Mfg. Co., Inc., Springfield, Mo.
Roessing Mfg. Co., Pittsburgh, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Standard Refrigeration Co., Chicago, Ill.
Stewart Ice Machine Co., Pomona, Calif.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitlock Mfg. Co., Hartford, Conn.
Wittenmeier Machinery Co., Chicago, Ill.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., Bronx, N. Y.

CONDENSERS, WATER DISTRIBUTORS FOR

See Distributors, Water, for Condensers

CONDENSING UNITS

See Compressors

CONDUCTORS AND PANELS, ELECTRICAL, FOR RADIANT HEATING

Adam Electric Co., Frank, St. Louis, Mo.
Berko Electric Co., Queens Village, N. Y.
Crystalheat Co., Van Nuys, Calif.
Continental Radiant Glass Heating Corp., New York, N. Y.
Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Electriglas Corp., Bergenfield, N. J. (electric glass panels)
Electromode Corp., Rochester, N. Y.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Roberson Co., L. N., Seattle, Wash.
Sunwarm, Inc., Kingsport, Tenn.
ThermoRay Corp., Irvington-On-Hudson, N. Y.
United States Rubber Co., New York, N. Y.
Wiegand Co., Edwin L., Pittsburgh, Pa.

CONDUIT, UNDERGROUND PIPING

Beltran Associates, Inc., Brooklyn, N. Y.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Dockstader, Inc., S. E., Washington, D. C.
Durant Insulated Pipe Co., Palo Alto, Calif.
Durant International Corp., Williamstown, N. J.
Heat Transmission Conduit Co., Cleveland, O.
Johns-Manville, New York, N. Y.
Kaiser Co., E. B., Glenview, Ill.
Michigan Pipe Co., Gagetown, Mich.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Porter & Co., Inc., H. W., Newark, N. J.
Ric-wiL, Inc., Barberton, O.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Stillwater Clay Products Co., The, Cleveland, O.
Water Tight Underground Conduit, Houston, Tex.

CONNECTIONS, DUCT, FLEXIBLE (ASBESTOS, CANVAS, ETC.)

American Metal Hose Div., The American Brass Co., Waterbury, Conn. (Metal)
Canvas Products Co., St. Louis, Mo.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Elgen Mfg. Corp., Long Island City, N. Y.
Felters Company, The, Boston, Mass.
Flexaust Co., New York, New York
Flexible Tubing Corp., Guilford, Conn.
Flexonics Corp., Maywood, Ill.
Grant Wilson Inc., Chicago, Ill.
St. Clair Rubber Co., Detroit, Mich.
Sall Mountain Co., Hamilton, O.
United States Rubber Co., New York, N. Y.
Ventfabrics Inc., Chicago, Ill.
Wagner Awning & Mfg. Co., Cleveland, O.
Wiremold Co., Hartford, Conn.

CONNECTORS, FILLING, HYDROSTATIC TEST

Mechanical Products Corp., Chicago, Ill.
Roylyn, Inc., Glendale, Calif.

CONNECTORS, FOR NON-METALLIC DUCT FABRICATION

Acme Steel Co., Chicago, Ill. (Strapping)
Lumm Co., A. H., Toledo, O.
United States Rubber Co., New York, N. Y.

CONTINUOUS HEATERS

See Heaters, Steam Jet, for Liquids

CONTROL, FOR INDIRECT WATER HEATERS

Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Bristol Co., The, Waterbury, Conn.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Detroit Controls Corp., Detroit, Mich.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jordan Corp., Cincinnati, O.
Klipfel Valves, Inc., Hamilton, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.

Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Watts Regulator Co., Lawrence, Mass.

CONTROL SYSTEMS, PRE-ASSEMBLED AS UNITS, FOR HEATING, COOLING AND VENTILATING

Factory Assemblies Using Other Manufacturers' Valves, Thermostats, Damper Motors, etc.

American Moistening Co., Providence, R. I.
Automatic Devices Co., Inc., Western Springs, Ill.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Barnes & Jones, Inc., Boston, Mass.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Carvell Heat Equipment Co., Los Angeles, Calif.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Dunham Co., C. A., Chicago, Ill.
Franklin Dales Co., Akron, O.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
International Business Machines Corp., New York, N. Y.
Master Control Co., The, Cuyahoga Falls, O.
Midwest Air Conditioning Co., Des Moines, Ia.
Midwest Automatic Control Co., Des Moines, Ia.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa. (package heat)
Ray Oil Burner Co., San Francisco, Calif.
Refrigeration Devices Co., Nutley, N. J.
Shallcross Controls, Inc., Milwaukee, Wis.
Webster & Co., Warren, Camden, N. J.
West Instrument Corp., Chicago, Ill.

CONTROLLERS AND STARTERS, MOTOR

ACEC Electric Corp., New York, N. Y.
Airgard Mfg. Co., Chicago, Ill.
Allen-Bradley Co., Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elec. Co., Hartford, Conn.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Clark Controller Co., Cleveland, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Ebert Electronics Corp., Queens Village, N. Y.
Electric Controller & Mfg. Co., Cleveland, O.
Electric Machinery Mfg. Co., Minneapolis, Minn.
Furnas Electric Co., Batavia, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
Ideal Electric & Mfg. Co., Mansfield, O.
International Business Machine Corp., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Monitor Controller, Rockland, Mass.
Penn Controls, Inc., Goshen, Ind.
Potter & Brumfield Sales Co., Princeton, Ind.
Radex Corp., Chicago, Ill.
Reynolds Electric Co., River Grove, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
United Electric Controls Co., Watertown, Mass.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Zenith Electric Co., Chicago, Ill.

CONTROLS, AIR CONDITIONING

See Humidistats; Indicator-Controllers; Operators, Damper; Operators, Valve; Recorder-Controllers; Regulators; Relays; Switches; Thermostats; Valves, Diaphragm; Valves, Refrigeration; Valves, Solenoid

CONTROLS, DOOR, ELECTRIC EYE (FOR AIR CONDITIONED ROOMS)

Barber-Colman Co., Rockford, Ill.
Deltron, Inc., Philadelphia, Pa.
De-Tec-Tronic Corp., Chicago, Ill.
Ess Instrument Co., Bergenfield, N. J.
Stanley Works, The, New Britain, Conn.
Sterns-Flinn Corp., New York, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Worner Electronic Devices, Rankin, Ill.

CONTROLS, DRAFT, BAROMETRIC

Ace Instrument Co., Inc., Brooklyn, N. Y.
Boston Machine Works Co., Lynn, Mass.
Bristol Co., The, Waterbury, Conn.
Cleveland Fuel Equipment Co., Cleveland, O.
Cole-Sewell Engineering Co., St. Paul, Minn.
Combustion Equipment Co., Moline, Ill.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Ess Instrument Co., Bergenfield, N. J.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Fuelguard Co., Dallas, Tex.
Fuel Reduction Corp., Chicago, Ill.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Hotstream Heater Co., Cleveland, O.
Krueger Sentry Gauge Co., Green Bay, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Preferred Utilities Mfg. Corp., New York, N. Y.
Salina Metal Products Co., Salina, Kan.
Simplex Mfg. Co., Fond du Lac, Wis.
Steinen Mfg. Co., Wm., Newark, N. J.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Windmaster Corp., Columbus, O.

CONTROLS, FIRE PROTECTION SPRINKLER SYSTEMS

Allen Mfg. Co., W. D., Chicago, Ill.
American District Telegraph Co., New York, N. Y.
Automatic Control Co., St. Paul, Minn.
Clark Controller Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Synchro-Start Products, Inc., Skokie, Ill.

CONTROLS, FLAME FAILURE

A-P Controls Corp., Milwaukee, Wis.
American District Telegraph Co., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Bressler Engineering Service, Oregon, Ill.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., St. Louis, Mo.
De-Tec-Tronic Corp., Chicago, Ill.
Drying Systems, Inc., Chicago, Ill.
Electronics Corp. of America, Cambridge, Mass.
Ess Instrument Co., Bergenfield, N. J.
Fenwal Inc., Ashland, Mass.
Fuelguard Co., Dallas, Tex.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Haney Gas Burner & Engrs., Inc., Monrovia, Calif.
Mercoid Corp., The, Chicago, Ill.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Controls, Inc., Goshen, Ind.
Stout & Sons, David, St. Louis, Mo.
Webster Engineering Co., Tulsa, Okla.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
White-Rodgers Electric Co., St. Louis, Mo.

CONTROLS, HEATING

See Alarms; Humidistats; Indicator-Controllers; Operators, Damper; Operators, Valve; Recorder-Controllers; Regulators; Relays; Switches; Systems, Combustion Control; Systems, Heating; Thermostats; Valves, Balancing, for Forced Hot Water Heating Systems; Valves, Diaphragm; Valves, Flow Control; Valves, Mixing; Valves, Pressure Reducing and Regulating; Valves, Radiator; Valves, Solenoid

CONTROLS, PUSH-PULL

See Shafts, Flexible, Push-Pull, for Control

CONTROLS, REFRIGERATION

See Humidistats; Operators, Valve; Relays; Switches; Thermostats; Valves, Refrigeration; Valves, Solenoid

CONVECTORS

See Radiation, Convection Type

CONVERTORS, STEAM

Alstrom Corp., New York, N. Y.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Buxton Mfg. Co., Dover, N. J.
Davis Engineering Corp., Elizabeth, N. J.
General Fittings Co., East Greenwich, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Novelty Steam Boiler Works, Inc., Baltimore, Md.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Republic Products Co., Philadelphia, Pa.
Richmond Engineering Co., Richmond, Va.
Taco Heaters, Inc., Cranston, R. I.
Yula Water Heaters, Inc., Bronx, N. Y.

CONVEYORS, COAL AND ASH

Ajax Flexible Coupling Co., Westfield, N. Y.
American Coal Burner and Wood Stoker Corp., Chicago, Ill.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I. (continuous weighing)
Canton Stoker Corp., Canton, O.
Chain Belt Co., Milwaukee, Wis.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, O.
CraneVeyor Corp., Los Angeles, Calif.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Hager Bros., Rockford, Ill.
Hewitt-Robins, Inc., Stamford, Conn.
Jeffrey Mfg. Co., Columbus, O.
Johnston & Jennings Co., Cleveland, O.
Joy Mfg. Co., Pittsburgh, Pa.
Kol-Master Corp., Oregon, Ill.
Link-Belt Co., Chicago, Ill.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Spurgeon Co., Van Dyke, Mich.
Standard Transmission Equipment Co., Pasadena, Calif.
Whitty Co., Inc., Boston, Mass.

COOLERS, CRANE CAB

Dravo Corp., Pittsburgh, Pa.
Lintern Corp., Painesville, O.
Refrigeration Economics Co., Inc., Canton, O.
Trane Co., The, LaCrosse, Wis.

COOLERS, EVAPORATIVE

See Units, Air Conditioning, Summer, Evaporative Cooling Type

COOLERS, OIL

Acme Industries, Inc., Jackson, Mich.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Cooling Tower Co., Kansas City, Mo.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Andale Co., Philadelphia, Pa.
Armstrong Co., Richard M., Westchester, Pa.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., The, Elyria, O.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Whittier, Calif.
G & O Mfg. Co., New Haven, Conn.

General Heaters & Regulators Co., East Chicago, Ind.
Gilbert Brass Foundry Co., St. Louis, Mo.
Graham Mfg. Co., Inc., New York, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Kellog Co., The, M. W., New York, N. Y.
Kewanee-Ross Corp., Kewanee, Ill.
Manning & Lewis Engineering Co., Newark, N. J.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
Modine Mfg. Co., Racine, Wis.
National Pipe Bending Co., New Haven, Conn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Struthers Wells Corp., Titusville, Pa.
Super Radiator Corp., Minneapolis, Minn.
Taco Heaters, Inc., Cranston, R. I.
Temprite Products Corp., Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
Tranter Mfg., Inc., Lansing, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Whitlock Mfg. Co., Hartford, Conn.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., Bronx, N. Y.

COOLERS, UNIT (FLOOR TYPE)

Not air conditioning units, but floor mounted unit with coil and centrifugal fans without filters, for connection to remote compressor or cold water supply. For air conditioning units see Units, Air Conditioning

American Blower Corp., Detroit, Mich.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dole Refrigerating Co., Chicago, Ill.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Frick Co., Waynesboro, Pa.
Governair Corp., Oklahoma City, Okla.
Howe Ice Machine Co., Chicago, Ill.
King Co. of Owatonna, The, Owatonna, Minn.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Niagara Blower Co., New York, N. Y.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Yorktowne Machine Co., York, Pa.
Young Radiator Co., Racine, Wis.

COOLERS, UNIT (SUSPENDED TYPE)

Not air conditioning units, but suspended unit with coil and propeller fan, without filters, for connection to remote compressor or cold water supply. For air conditioning units, see Units, Air Conditioning

American Blower Corp., Detroit, Mich.
American Coils Co., Newark, N. J.
American Cooling Tower Co., Kansas City, Mo.
Auburn Burner Co., Auburn, Ind.
Betz Corp., Hammond, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Governair Corp., Oklahoma City, Okla.
Howe Ice Machine Co., Chicago, Ill.
King Co. of Owatonna, The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Merchant & Evans Co., Philadelphia, Pa.
Murray Mfg. Co., D. J., Wausau, Wis.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Vilter Mfg. Co., Milwaukee, Wis.
Wilson Engineering Corp., Chicago, Ill.
Wing Mfg. Co., L. J., Linden, N. J.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.

COOLING COILS

See Surface Finned Cooling

COOLING SURFACE

See Surface Finned Cooling

COOLING TOWERS

See Towers, Cooling

COOLING UNITS

See Units, Air Conditioning; Coolers, Unit

COPPER PIPE

See Pipe, Brass and Copper

COPPER SHEETS

See Sheets, Copper

COPPER TUBE FITTINGS

See Fittings, Copper Tube

COPPER TUBE FITTINGS, FLARED

See Fittings, Copper Tube, Flared

COPPER TUBING

See Tubing, Brass and Copper

CORROSION PREVENTIVES

See Devices, Electrolytic, for Preventing Corrosion; Treatment, Steam System, to Inhibit Corrosion; and Treatment, Water, to Inhibit Corrosion

COUNTERS, DUST

Bausch & Lomb Optical Co., Rochester, N. Y.
Hill & Co., E. Vernon., Lake Geneva, Wis.
Mine Safety Appliances Co., Pittsburgh, Pa.
Service to Industry, West Hartford, Conn.
Willson Products, Inc., Reading, Pa.

COUPLINGS, FLEXIBLE, POWER TRANSMISSION

Ajax Flexible Coupling Co., Westfield, N. Y.
American Flexible Coupling Co., Erie, Pa.
Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich. (Universal joints)
Boston Gear Wks., Quincy, Mass.
Brooks Equipment Corp., Hoboken, N. J.
Browning Mfg. Co., Maysville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago, Ill.
Chain Belt Co., Milwaukee, Wis.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Climax Metal Products Co., Cleveland, O.
Congress Drives Div., Tann Corp., Detroit, Mich.
De Laval Steam Turbine Co., Trenton, N. J.
Dings Magnetic Separator Co., Milwaukee, Wis.
Dodge Mfg. Corp., Mishawaka, Ind.
Elliott Co., Jeannette, Pa.
Falk Corp., Milwaukee, Wis.
Guardian Products Corp., Michigan City, Ind.
Jeffrey Mfg. Co., Columbus, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Limitorque Corp., Philadelphia, Pa.
Link Belt Co., Chicago, Ill.
Lord Mfg. Co., Erie, Pa.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Mercury Clutch Div., Automatic Steel Products, Inc., Canton, O. (automatic centrifugal clutch)
Morse Chain Co., Ithaca, N. Y.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Piezo Mfg. Corp., Staten Island, N. Y.
Poole Foundry & Machine Co., Baltimore, Md.
Ramsey Chain Co., Inc., Albany, N. Y.
Royersford Foundry & Machine Co., Inc., Royersford, Pa.
Shallcross Co., Philadelphia, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Smith & Serrell, Inc., Newark, N. J.
Stow Mfg. Co., Binghamton, N. Y.
Thomas Flexible Coupling, Warren, Pa.
Waldron Corp., John, New Brunswick, N. J.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whitney Chain Co., Hartford, Conn.
Wood's Sons Co., T. B., Chambersburg, Pa.

COUPLINGS, PIPE

Acheson Mfg. Co., Rankin, Pa.
Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
Aeroquip, Inc., Van Wert, O.
Baker & Co., R. H., 2070 Slauson Ave., Huntington Park, Calif.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Camco Products Inc., North Haven, Conn.
Capitol Mfg. & Supply Co., Columbus, O.
Champion Machine & Forging Co., Cleveland, O.
Chase Brass & Copper Co., Waterbury, Conn.
Clow & Sons, James B., Chicago, Ill.
Continental-Diamond Fibre, Newark, Del.
Cooper-Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Fischer & Porter Co., Hatboro, Pa. (glass)
Flagg & Co., Inc., Stanley G., Philadelphia.
Flodar Corp., Cleveland, O.
Frick Co., Waynesboro, Pa.
Frontier Bronze Corp., Niagara Falls, N. Y.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Harrisburg Steel Corp., Harrisburg, Pa.
Illinois Malleable Iron Co., Chicago, Ill.
Johns-Manville, New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
King Union Co., Inc., Hillsgrove, R. I.
Ladish Co., Cudahy, Wis.
Malleable Iron Fittings Co., Branford, Conn.
Marman Products Co., Inc., A Subsidiary of Aeroquip Corp., Los Angeles, Calif.
Master Enterprise Corp. of America, Tulsa, Okla.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Morris Coupling & Clamp Co., Kittanning, Pa.
Mueller Brass Co., Port Huron, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
New York Brass Foundry, New York, N. Y. (brass)
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pipeline Development Co., Cleveland, O.
Pipe Plugs, Inc., Wellington, O.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Rhode Island Fittings Co., Providence, R. I.
Roylyn, Inc., Glendale, Calif.

Star Stainless Screw Co., Paterson, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Stokes Molded Products, Trenton, N. J. (unplasticized polyvinyl chloride)
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky. (welding couplings)
Union Metal Works, Chelsea, Mass.
U. S. Plug & Fitting Co., Wellington, O.
United States Gasket Co., Camden, N. J.
United States Stoneware Co., New York, N. Y.
Victaulic Co. of America, Elizabeth, N. J.
Vogt Machine Co., Henry, Louisville, Ky.
Wachs Co., E. H., The, Chicago, Ill.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J. (forged steel)
Weatherhead Co., The, Cleveland, O.
Wheatland Tube Co., Philadelphia, Pa.
Wheeling Machine Products Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Youngstown Sheet & Tube Co., Youngstown, O.

COUPLINGS, PIPE, DETACHABLE

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
Aeroquip, Inc., Van Wert, O.
Anchor Coupling Co., Libertyville, Ill. (hose)
Cooper Alloy Corp., Hillside, N. J.
Dahl, G. W., Bristol, R. I.
Gates Engineering Co., Wilmington, Del.
Hunt & Son, C.B., Inc., Salem, O.
Morris Coupling & Clamp Co., Kittanning, Pa.
OPW Corp., Cincinnati, O.
Quick Joint Div., Automatic Bending Co., Harvey, Ill.
Roylyn, Inc., Glendale, Calif.
Smith Bros. Co., Oak Park, Ill.
Snap-Tite, Inc., Union City, Pa.
Victaulic Co. of America, Elizabeth, N. J.
Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.

COVERS, PROTECTIVE, FOR WINDOW AIR CONDITIONERS

Blossom Mfg. Co., Inc., New York, N. Y.
Canvas Products Co., St. Louis, Mo.
International Covers for Air Conditioners Corp., New York, N. Y.
Keller-Northrup, Inc., Dallas, Tex.
Wagner Awning & Mfg. Co., Cleveland, O.

CRANE CAB COOLERS

See Coolers, Crane Cab

CUT-OFFS, LOW WATER, HEATING BOILER

Eclipse Fuel Engineering Co., Rockford, Ill.
Econo Products Company, Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Instruments, Inc., Tulsa, Okla.
Johnson Corp., The, Three Rivers, Mich.
Magnetrol Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Newark Controls Co., Bloomfield, N. J.
Schaub Engineering Co., Fred H., Chicago.
Techniflex Corp., Port Jervis, N. Y.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

CUTTERS, FLAME FOR PIPING

National Cylinder Gas Co., Chicago, Ill.
Springload Mfg. Corp., Seattle, Wash.
Vernon Tool Co., Ltd., Alhambra, Calif.

CUTTERS, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Barnes Tool Co., The, New Haven, Conn.
Beaver Pipe Tools, Inc., Warren, O. (knife and wheel)
Capewell Mfg. Co., Hartford, Conn.
Clow & Sons, James B., Chicago, Ill.
Continental Machine Co., Chicago, Ill.
Crown Die & Tool Corp., Chicago, Ill.
Erie Tool Works, Erie, Pa.
Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.
Hollands Mfg. Co., Erie, Pa.
Kalamazoo Tank & Silo Co., Machine Tool Div., Kalamazoo, Mich. (metal cutting band saw)
Landis Machine Co., Inc., Waynesboro, Pa.
M-M-A, Inc., Lancaster, Pa.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Cleveland, O. (portable power)
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Saunders Mfg. Co., Yonkers, N. Y.
Springload Mfg. Corp., Seattle, Wash.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass. (hand)
Wachs Co., E. H., The, Chicago, Ill. (pipe saw)

CUTTERS, TUBING

Armstrong Bros. Tool Co., Chicago, Ill.
Bonney Forge & Tool Works, Allentown, Pa.
Capewell Mfg. Co., Hartford, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Continental Machine Co., Chicago, Ill.
Couplings Co., Chicago, Ill.
Duro Metal Products Co., Chicago, Ill.
Fenway Machine Co., Philadelphia, Pa. (also sheet metal)
Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.
Imperial Brass Mfg. Co., Chicago, Ill.
Landis Machine Co., Inc., Waynesboro, Pa.
Mueller Brass Co., Port Huron, Mich.
Nye Tool Co., Chicago, Ill.
Parker Appliance Co., The, Cleveland, O.
Penn Brass & Copper Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Springload Mfg. Corp., Seattle, Wash.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass. (hand)
Wallace Supplies Mfg. Co., Chicago, Ill.
Weatherhead Co., Cleveland, O.

DAMPER OPERATORS

See Operators, Damper

DAMPER REGULATORS

See Regulators, Damper Sets

DAMPERS, DIFFUSER

Air Control Products, Inc., Coopersville, Mich.
Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Gallaher Co., The, Omaha, Neb.
Hart & Cooley Mfg. Co., Holland, Mich.
Lima Register Co., Lima, O.
Rittling Corp., The, Buffalo, N. Y.
Round Oak Co., Inc., Dowagiac, Mich.
United States Register Co., Battle Creek, Mich.

DAMPERS, DUCT, MANUALLY OPERATED

Acme Mfg. Co., Philadelphia, Pa.
Adams Co., The, Dubuque, Ia.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Air Conditioning Engineering Co., Cambridge, Mass.
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Ammerman Co., C. L., Minneapolis, Minn.
Anemostat Corp. of America, New York.
Controlair Mfg. Co., Los Angeles, Calif.
Corbman Bros., Inc., Philadelphia, Pa.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Elgo Shutter & Mfg. Co., Detroit, Mich.
Excelsior Steel Furnace Co., Chicago, Ill.
General Register Corp., Cedar Grove, N. J.
Hart & Cooley Mfg. Co., Holland, Mich.
Imperial Damper Co., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Lennox Industries, Inc., Marshalltown, Ia.
Marsto Machine Co., West Quincy, Mass.
Minneapolis Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Powers Regulator Co., Skokie, Ill.
Rittling Corp., The, Buffalo, N. Y.
Round Oak Co., Inc., Dowagiac, Mich.
Seelye Craftsman, Minneapolis, Minn.
Sioux Steel Co., Sioux Falls, S. D.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Waterloo Register Co., Inc., Waterloo, Ia.
Williamson Co., Cincinnati, O.
Young Regulator Co., Cleveland, O.

DAMPERS, DUCT, REMOTE CONTROLLED

Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Anemostat Corp. of America, New York.
Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Buensod-Stacey, Inc., New York, N. Y.
Combustion Equipment Co., Moline, Ill.
Controlair Mfg. Co., Los Angeles, Calif.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Reguator Co., Skokie, Ill.
Rittling Corp., The, Buffalo, N. Y.
Seelye Craftsman, Minneapolis, Minn.
Shallcross Controls, Inc., Milwaukee, Wis.
Tuttle & Bailey, Inc., New Britain, Conn.
Vapor Heating Corp., Chicago, Ill.
Young Regulator Co., Cleveland, O.

DAMPERS, FIRE, FUSIBLE LINK

Air-Path Products Co., Baltimore, Md.
American Foundry & Furnace Co., Bloomington, Ill.
Controlair Mfg. Co., Los Angeles, Calif.
Haertel Co., Walter, Minneapolis, Minn.
Imperial Damper Co., New York, N. Y.
Seelye Craftsman, Minneapolis, Minn.

DAMPERS, PULSATION, FOR PIPING SYSTEMS

Campbell Co., J. A., Long Beach, Calif.
Fluor Products Co., A Div. of the Fluor Corp. Ltd., Whittier, Calif.
Greer Hydraulics, Inc., Jamaica, N. Y.
Industrial Acoustics Co., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.

DEAERATORS

Acker Organization, Inc., W. M., Meridian, Miss.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Water Softener Co., Philadelphia.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Blaw Knox Co., Buflovak Equipment Div., Buffalo, N. Y.
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Elgin Softener Corp., Elgin, Ill.
Elliott Co., Jeannette, Pa.
Finnigan & Co., Inc., J.J., Atlanta, Ga.
General Filter Co., Ames, Ia.
General Heaters & Regulators Co., East Chicago, Ind.
Graham Mfg. Co., Inc., New York, N. Y.
Graver Water Conditioning Co., New York.
Hoppes Mfg. Co., Inc., Springfield, O.
Kewanee-Ross Corp., Kewanee, Ill.
Permutit Co., New York, N. Y.
Schaub Engineering Co., Fred H., Chicago.
Sims Co., Erie, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
Swartwout Co., The, Cleveland, O.
Whitlock Mfg. Co., Hartford, Conn.
Worthington Corp., Harrison, N. J.

DEEP WELL PUMPS

See Pumps, Deep Well

DEHUMIDIFIERS, ABSORPTION AND ADSORPTION

Air Conditioning Engineering Co., Cambridge, Mass.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York, N. Y.
Cargocaire Engineering Corp., New York.
Desomatic Products, Inc., Falls Church, Va.
Dow Chemical Co., The, Midland, Mich.
Drying Systems, Inc., Chicago, Ill.
Dryomatic Corp., Alexandria, Va.
Floridin Co., Tallahassee, Fla.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Kaufman Co., H. J., Detroit, Mich.
Pittsburgh Lectrodryer Corp., Pittsburgh, Pa.
Socony-Mobil Oil Co., Inc., New York, N. Y.
Somers, Inc., H. J., Detroit, Mich.
Surface Combustion Corp., Toledo, O.
Tamms Industries, Inc., Chicago, Ill.

DEHUMIDIFIERS FOR COMPRESSED AIR

Centrifix Corp., Cleveland, O.
Desomatic Products, Inc., Falls Church, Va.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
General Heaters & Regulators Co., East Chicago, Ind.
Perfecting Service Co., Charlotte, N. C.
Pittsburgh Lectrodryer Corp., Pittsburgh, Pa.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Selas Corp. of America, Philadelphia, Pa.

DEHUMIDIFIERS, ELECTRIC PLUG-IN, FOR SMALL SPACES

Abbeon Supply Co., Jamaica, N. Y.
Blissfield Mfg. Co., Blissfield, Mich.
Cargocaire Engineering Corp., New York, N. Y.
Desomatic Products, Inc., Falls Church, Va.
Dryomatic Corp., Alexandria, Va.
Ebco Mfg. Co., Columbus, O.
Fedders-Quigan Corp., Buffalo, N. Y.
Fresh'nd-Aire Company, Div. of Cory Corp., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati.
Haertel Co., Walter, Minneapolis, Minn.
Hotpoint Co., Chicago, Ill.
Hunter Fan & Ventilating Co., Inc., Memphis, Tenn.
McGraw Electric Co., Lonergan Mfg. Div., Albion, Mich.
Mitchell Mfg. Co., Chicago, Ill.
Radio Corp. of America, RCA Victor Div., Camden, N. J.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Robbins & Myers, Inc., Fan Div., Memphis, Tenn.
Taylor Co., Halsey W., Warren, O.
Victor Products Corp., Hagerstown, Md.
Walton Laboratories, Inc., Irvington, N. J.
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass.
Whirlpool-Seegar Corp., Evansville, Ind.

DEHUMIDIFIERS, SPRAY

See Washers, Air

DEHUMIDIFIERS, SPRAYED COIL

Air & Refrigeration Corp., New York, N. Y.
American Blower Corp., Detroit, Mich.
Blazer & Son, M., Passaic, N. J.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Kennard Corp., St. Louis, Mo.
Marlo Coil Co., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
York Corp., York, Pa.

DEHUMIDIFYING UNITS

See Units, Air Conditioning; Dehumidifiers

DEHYDRANT AND ACID NEUTRALIZER, FOR REFRIGERATING SYSTEMS

Allin Mfg. Co., Chicago, Ill.
Davison Chemical Co., Div. of W. R. Grace & Co., Baltimore, Md.
Highside Chemicals Co., A Unit of Stewart Industries, Inc., Clifton, N. J.
McIntire Co., The, Newark, N. J.
Mueller Brass Co., Port Huron, Mich.
Remco, Inc., Zelienople, Pa.

DEHYDRATORS, REFRIGERANT

A-P Controls Corp., Milwaukee, Wis.
Aluminum Co. of America, Pittsburgh, Pa.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Eagle Chemical Co., Inc., Chicago, Ill.
Floridin Co., Tallahassee, Fla.
Frigidaire Div., General Motors Corp., Dayton, O.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Madden Brass Products Co., Aurora, Ill.
McIntire Co., The, Newark, N. J.
Mueller Brass Co., Port Huron, Mich.
Remco, Inc., Zelienople, Pa.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Wabash Corp., Chicago, Ill.

DENSIFIERS, CONCRETE, FOR INCREASING THERMAL CONDUCTIVITY

Products Planning Co., Pittsburgh, Pa.

DESTROYERS, SOOT, CHEMICAL

Allen Co., Robert G., Mechanicsville, N. Y.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Coughlan Co., G. N., West Orange, N. J.
General Filters, Inc., Novi, Mich.
Hercules Chemical Co., Inc., New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., Cleveland, O.
Nutmeg Chemical Co., New Haven, Conn.
Perolin Co., Inc., Chicago, Ill.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Saverite Engineering Co., Hoboken, N. J.
Tamms Industries, Inc., Chicago, Ill.
Warren Refining & Chemical Co., The, Cleveland, O.
Western Chemical Co., Kansas City, Mo.

DESUPERHEATERS, STEAM

Babcock & Wilcox Co., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Brown Fintube Co., The, Elyria, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Foster Wheeler Corp., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Springfield Boiler Co., Springfield, Ill.
Swartwout Co., The, Cleveland, O.
Whitlock Mfg. Co., Hartford, Conn.

DETECTORS, LEAK, FUEL OIL

American Gas & Chemicals, Inc., New York, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Techniflex Corp., Port Jervis, N. Y.
Yula Water Heaters, Inc., Bronx, N. Y.

DETECTORS, LEAK, PIPING

American Gas & Chemicals, Inc., New York (gas, hydrogen, nitrogen, oxygen, ammonia, chloride)
Universal Controls Corp., Dallas, Tex.

DETECTORS, LEAK, REFRIGERANT

Allin Mfg. Co., Chicago, Ill.
American Gas & Chemicals, Inc., New York, N. Y.
Bernz Co., Otto, Rochester, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Goss Gas, Inc., Pittsburgh, Pa.
Highside Chemicals Co., A Unit of Stewart Industries, Inc., Clifton, N. J.
Insto-Gas Corp., Detroit, Mich.
Justrite Mfg. Co., Chicago, Ill.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
National Cylinder Gas Co., Chicago, Ill.
Turco Products, Inc., Los Angeles, Calif.
Turner Brass Wks., Sycamore, Ill.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.
Weldit, Inc., Detroit, Mich.

DETECTORS, LEAK, UNDERGROUND PIPING

Fisher Research Laboratory, Inc., Palo Alto, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Johnson-Williams Inc., Palo Alto, Calif.
Mine Safety Appliance Co., Pittsburgh, Pa.
Radioactive Products, Inc., Ferndale, Mich.
Wilkinson Products Co., Pasadena, Calif.

DEVICES, ELECTROLYTIC, FOR PREVENTING CORROSION

Brown Electro Co., Oklahoma City, Okla.
Cleveland Heater Co., Cleveland, O. (anodic rods)
Division Lead Co., Summit, Ill.
Electro Rust-Proofing Corp., Belleville, N. J.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Harco Corp., Bedford, O.
Magnode Products, Inc., Trenton, O.
Maloney Co., F. H., Houston, Tex. (flange insulated couplings)
Marlo Coil Co., St. Louis, Mo.
May Company, Galesburg, Ill.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
Rotometals, San Francisco, Calif.
Wallace & Tiernan Inc., Belleville, N. J.

DEW POINT INDICATORS

See Indicators, Dew Point

DIAPHRAGM VALVES

See Valves, Diaphragm

DIESEL ENGINES

See Engines, Diesel, for Fan, Pump and Compressor Drives

DIFFUSERS, AIR, BASEBOARD

Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Auer Register Co., Cleveland, O.
Brandes Co., Madison, Wis.
Coleman Co., Inc., The, Wichita, Ks.
General Automatic Products Corp., Baltimore, Md.
Gerwin Industries, Inc., Michigan City, Ind.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lima Register Co., Lima, O.
Patco Mfg. Co., Philadelphia, Pa.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Thermo-Base Div., Gerwin Industries, Michigan City, Ind.
Titus Mfg. Corp., Waterloo, Ia.
Viking Mfg. Corp., Cleveland, O.
Vulcan Radiator Co., Hartford, Conn.

DIFFUSERS, AIR, CEILING

See also Grilles; Panels, Perforated, for Air Diffusions; Registers

Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.

Air Distribution Products Co., Los Angeles, Calif.
Air Fan Engineering Co., Los Angeles, Calif.
Aladdin Heating Corp., San Leandro, Calif.
Anemostat Corp. of America, New York, N. Y.
Ashburn Supply Co., Culver City, Calif.
Barber-Colman Co., Rockford, Ill.
Carnes Corp., Verona, Wis.
Coleman Co., Inc., The, Wichita, Ks.
Connor Engineering Corp., Danbury, Conn.
Demuth & Sons, Inc., Charles, Mineola, L. I., N. Y.
Gallaher Co., The, Omaha, Neb.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Krueger Air Conditioning Co., Tucson, Ariz.
Lima Register Co., The, Lima, O.
Midco Register Corp., St. Paul, Minn.
Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., New York, N. Y.
Viking Mfg. Corp., Cleveland, O.
Young Regulator Co., Cleveland, O.

DIFFUSERS, AIR, CEILING WITH COMBINED LIGHTING FIXTURE

Air Devices, Inc., New York, N. Y.
Anemostat Corp. of America, New York.
Barber-Colman Co., Rockford, Ill.
Carnes Co., Verona, Wis.
Connor Engineering Corp., Danbury, Conn.
Demuth & Sons, Inc., Charles, Mineola, L. I., N. Y.
Universal Diffuser Corp., New York, N. Y.
Wakefield Co., The, Vermillion, O.

DIFFUSERS, AIR, FLOOR

A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Coleman Co., Inc., The, Wichita, Ks.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Lima Register Co., Lima, O.
Ritter Pattern & Casting Co., Inc., New York.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.

DIFFUSERS, AIR, HIGH PRESSURE

Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Coleman Co., Inc., The, Wichita, Ks.
Connor Engineering Corp., Danbury, Conn.
Demuth & Sons, Inc., Charles, Mineola, L. I., N. Y.
Independent Register Co., Cleveland, O.
Lima Register Co., Lima, O.
Titus Mfg. Corp., Waterloo, Iowa
Tuttle & Bailey, Inc., New Britain, Conn.
Universal Diffuser Corp., New York, N. Y.

DIFFUSERS, AIR, WALL

A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Air Distribution Products Co., Los Angeles.
Air-Factors, Inc., Monrovia, Calif.
Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Coleman Co., Inc., The, Wichita, Ks.
Demuth & Sons, Inc., Charles, Mineola, L. I., N. Y.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Lima Register Co., Lima, O.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Titus Mfg. Corp., Waterloo, Ia.
Universal Diffuser Corp., New York, N. Y.

DIFFUSION, AIR

See Panels, Perforated, for Air Diffusion

DISTRIBUTORS, REFRIGERANT, FOR COOLING COILS

General Controls Co., Glendale, Calif.
Sporlan Valve Co., St. Louis, Mo.

DISTRIBUTORS, WATER, FOR CONDENSERS

Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Hubbell Corp., Mundelein, Ill.

DOOR CONTROLS

See Controls, Door, Electric Eye

DOORS AND PANELS, ACCESS

Adams Co., The, Dubuque, Ia.
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Metal Works, Inc., New Orleans, La.
Auer Register Co., Cleveland, O.
Biersach & Niedermeyer Co., Milwaukee, Wis.
Camloc Fastener Corp., Paramus, N. J. (Fasteners for)
Clarage Fan Co., Kalamazoo, Mich.
Falstrom Co., Passaic, N. J.
Haertel Co., Walter, Minneapolis, Minn.
Inland Steel Products Co., Milwaukee, Wis.
International Steel Co., Evansville, Ind.
Kirk & Blum Mfg. Co., Cincinnati, O.
Knapp Bros. Mfg. Co., Inc., Cincinnati, O.
Lumm Co., A. H., Toledo, O.
Technical Ply-Wood Sales, Chicago, Ill.
Walsh Co., L. M., The, Boston, Mass.
Western Wire & Iron Works, Inc., Chicago, Ill. (Metal)
Willis Steel Corp., Galesburg, Ill.
Zurn Mfg. Co., J. A., Erie, Pa.

DRAFT CONTROL

See Controls, Draft, Barometric; Regulators, Draft, Combustion

DRAFT GAGES

See Gages, Indicating, Draft

DRAFT RECORDERS

See Recorders, Draft

DRAFT REGULATORS

See Controls, Draft, Barometric; Regulators, Draft, Combustion

DRAINS, TANK, FOR HOT WATER HEATING SYSTEM EXPANSION TANKS

Quality Specialty Co., Inc., Camden, N. J.
Thrush & Co., H. A., Peru, Ind.

DRAWING TEMPLATES, PIPING

See Templates, Drawing, Piping

DRIERS

See Dehydrators, Refrigerant

DRILLS, ELECTRIC AND PNEUMATIC, PORTABLE

Albertson & Co., Inc., Sioux City, Ia.
Anderson & Co., Inc., Sioux City, Ia.
Black & Decker Mfg. Co., Towson, Md.
Buckeye Tools Corp., Dayton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Cincinnati Electrical Tool Co., The, Cincinnati, O.
Clisbe Bros. Mfg. Co., Plymouth, Ind.
Dayton Electric Mfg. Co., Chicago, Ill.
Famco Machine Co., Kenosha, Wis.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Mall Tool Co., Chicago, Ill.
Millers Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Oster Mfg. Co., John, Milwaukee, Wis.
Polis Mfg. Co., J. D., Chicago, Ill.
Porter-Cable Machine Co., Syracuse, N. Y.
Portable Electric Tools, Inc., Chicago, Ill.
Schramm, Inc., West Chester, Pa.
Skil Corp., Chicago, Ill.
Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago (Cicero), Ill.
Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Stanley Works, The, New Britain, Conn.
Syntron Co., Homer City, Pa.
Tempo Products Co., Cleveland, O.
Thor Power Tool Co., Aurora, Ill.
U. S. Electrical Tool Co., Cincinnati, O.
Wodack Electric Tool Corp., Chicago, Ill.

DRILLS, MASONRY

Arro Expansion Bolt Co., Marion, O.
Carboloy Dept. of General Electric Co., Detroit, Mich.
Chicago Expansion Bolt Co., Chicago, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
DoAll Co., The, Des Plaines, Ill.
Mall Tool Co., Chicago, Ill.
Molco Drilling Machines, Inc., Washington, D. C.
New England Carbide Tool Co., Inc., Cambridge, Mass.
Paine Co., Addison, Ill.
Rawplug Co., Inc., The, New York, N. Y.
Schramm, Inc., West Chester, Pa.
Star Expansion Bolt Co., New York, N. Y.
Tempo Products Co., Cleveland, O.
Termite Drills, Inc., Pasadena, Calif.
Threadwell Tap & Die Co., Greenfield, Mass.
U. S. Expansion Bolt Co., York, Pa.
Williams & Co., J. H., Buffalo, N. Y.
Wodack Electric Tool Corp., Chicago, Ill.

DRIVES, CHAIN

Boston Gear Works, Quincy, Mass.
Browning Mfg. Co., Maysville, Ky.
Chain Belt Co., Milwaukee, Wis.
CraneVeyor Corp., Los Angeles, Calif.
Dodge Mfg. Corp., Mishawaka, Ind.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Jeffrey Mfg. Co., Columbus, O.
Link Belt Co., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.
Ramsey Chain Co., Inc., Albany, N. Y.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Whitney Chain Co., Hartford, Conn.

DRIVES, COOLING TOWER FAN

Cleveland Worm & Gear Co., Cleveland, O.
Doerr Electric Corp., Cedarburg, Wis.
Hydreco Div., New York Air Brake Co., Cleveland, O.
Michigan Tool Co., Detroit, Mich.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Pritchard & Co. of California, J. F., Kansas City, Mo.

DRIVES, FLAT BELT

See also Belting, Leather and Belting, Rubber

American Pulley Co., Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Maysville, Ky.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Dodge Mfg. Corp., Mishawaka, Ind.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Goodrich Co., B. F., Akron, O.
New York Belting & Packing Co., Passaic, N. J.
Pyott Foundry & Machine Co., Chicago, Ill.
Rhoads & Sons, J. E., Wilmington, Del.
Williams & Son, I. B., Dover, N. H.
Wood's Sons Co., T. B., Chambersburg, Pa.

DRIVES, FLUID OR HYDRAULIC, FOR POWER TRANSMISSION

Dodge Mfg. Corp., Mishawaka, Ind.
Hydreco Div., New York Air Brake Co., Cleveland, O.
Link Belt Co., Chicago, Ill.
Twin Disc Clutch Co., Rockford, Ill.

DRIVES, GEAR

Boston Gear Works, Quincy, Mass.
Falk Corp., Milwaukee, Wis.
Hewitt-Robins, Inc., Stamford, Conn.
Lima Electric Motor Co., The, Lima, O.
Link-Belt Co., Chicago, Ill.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Pyott Foundry & Machine Co., Chicago, Ill.
Reliance Electric Engineering Co., Cleveland, O.
U. S. Electrical Motors, Inc., Los Angeles, Calif.

DRIVES, POWER FOR PIPE THREADING

Beaver Pipe Tools, Inc., Warren, O.
Nye Tool Co., Chicago, Ill.
Ridge Tool Co., Elyria, O.
Toledo Pipe Threading Machine Co., Toledo, O.

DRIVES, SHAFT MOUNTED

Falk Corp., Milwaukee, Wis.
Link-Belt Co., Chicago, Ill.
Philadelphia Gear Works, Inc., Philadelphia, Pa.

DRIVES, V BELT

Allis-Chalmers Mfg. Co., Milwaukee, Wis. (variable pitch)
American Pulley Co., Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Maysville, Ky.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Congress Drives Div., Tann Corp., Detroit, Mich.
Continental Rubber Wks., Erie, Pa.
Dayton Rubber Co., Dayton, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn.
Gates Rubber Co., The, Denver, Colo.
Goldens' Foundry & Machine Co., Columbus, Ga.
Goodrich Co., B. F., Akron, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Maurey Mfg. Corp., Chicago, Ill.
Pyott Foundry & Machine Co., Chicago, Ill.
Reeves Pully Co., Columbus, Ind.
Speed Selector Inc., Cleveland, O.
V-Belt Clutch Co., Los Angeles, Calif.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J.

DRIVES, VARIABLE SPEED

See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical; Reducers, Speed; Pulleys and Sheaves, for Belt Drives

DRYERS FOR COMPRESSED AIR

See Dehumidifiers for Compressed Air

DRYERS, INDUSTRIAL (COMPARTMENT, TUNNEL CONVEYOR, VACUUM, SPRAY, ROTARY, ETC.)

Aerotec Corp., The, Greenwich, Conn.
Air & Refrigeration Corp., New York, N. Y.
Beltran Associates, Inc., Brooklyn, N. Y.
Biggs Boiler Works Co., The, E. Akron, O.
Blaw Knox Co., Buflovak Equipment Div., Buffalo, N. Y.
Bowen Engineering, Inc., North Branch, N. J.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Kirk & Blum Mfg. Co., Cincinnati, O.
Link-Belt Co., Chicago, Ill.
Louisville Drying Machinery Unit, General American Transportation Corp., Louisville, Ky.
Mahon Co., R. C., The, Detroit, Mich.
Mahr Mfg. Co., Minneapolis, Minn.
Newcomb-Detroit Co., Detroit, Mich.
Peters-Dalton, Inc., Detroit, Mich.
Proctor & Schwartz, Inc., Philadelphia, Pa.
Raymond Div., Combustion Engineering Inc., Chicago, Ill.
Ross Engineering Corp., J. O., New York, N. Y.
Struthers Wells Corp., Titusville, Pa.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Western Precipitation Corp., Los Angeles, Calif.
Whiting Corp., Harvey, Ill.
Wiegand Co., Edwin L., Pittsburgh, Pa.

DRYERS, REFRIGERANT

See Dehydrators, Refrigerant

DUAL THERMOSTATS

See Thermostats, Two Temperature or Dual

DUCT CONNECTIONS

See Connections, Duct, Flexible; Connectors for Non-Metallic Duct Fabrication

DUCT FURNACES

See Heaters, Duct

DUCT HEATERS

See Heaters, Duct

DUCT INSULATION

See Insulation, Duct

DUCT THERMOSTATS

See Thermostats, Duct Type

DUCT TURNING VANES

See Vanes, Duct Turning, Prefabricated

DUCTS AND DUCT FITTINGS, PREFABRICATED, FLEXIBLE, METALLIC

American Metal Hose Div., The American Brass Co., Waterbury, Conn.
Arrowhead Rubber Co., Long Beach, Calif.
Buckeye Furnace Pipe Co., Columbus, O.
Coleman Co., Inc., The, Wichita, Kans.
Flexonics Corp., Maywood, Ill.
Henry Furnace Co., The, Medina, O.
Littleford Bros., Inc., Cincinnati, O.
Owens-Corning Fiberglas Corp., Toledo, O.
Round Oak Co., Inc., Dowagiac, Mich.
Solar Aircraft Co., San Diego, Calif.

DUCTS AND DUCT FITTINGS, PREFABRICATED, FLEXIBLE, NON-METALLIC

American Agile Corp., Bedford, O.
Arrowhead Rubber Co., Long Beach, Calif.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Flexaust Co., New York, N. Y.
Wiremold Co., Hartford, Conn.

DUCTS AND DUCT FITTINGS, PREFABRICATED, NON-FLEXIBLE, METALLIC

Acer & Whedon, Inc., Medina, N. Y.
Acme Mfg. Co., Philadelphia, Pa.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Ajax Furnace Fitting Co., Div. of Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Carrier Corp., Syracuse, N. Y. (spiral conduit for high pressure air distribution)
Champion Furnace Pipe Co., Peoria, Ill.
Char-Gale Mfg. Co., Minneapolis, Minn.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Coleman Co., Inc., The, Wichita, Ks.
Corbman Bros., Inc., Philadelphia, Pa.
Damascus Tube Co., Greenville, Pa.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Gray Metal Products, Inc., Rochester, N. Y.
Heil Process Equipment Corp., Cleveland, O. (lined)
Henry Furnace Co., The, Medina, O.
Howes-Woods Co., Cambridge, Mass.
Inland Steel Products Co., Milwaukee, Wis.
International Heater Co., Utica, N. Y.
Lamneck Div., Clayton & Lambert Mfg. Co., Middletown, O.
Lennox Industries, Inc., Columbus, O.
Lennox Industries, Inc., Marshalltown, Ia.
Lumm Co., A. H., Toledo, O.
Metal Fabricators, Inc., Charlotte, N. C.
Meyer & Bro. Co., F., Peoria, Ill.
Mueller Climatrol, Milwaukee, Wis.
Ohio Valley Hardware & Roofing Co., Evansville, Ind.
Pressure Airduct Corp., Skokie, Ill. (for high velocity systems)
Reeves Steel & Mfg. Co., Dover, O.
Round Oak Co., Inc., Dowagiac, Mich.
Schecter Brothers Co., Philadelphia, Pa.
Schoedinger, Inc., F. O., Columbus, O.
Sioux Steel Co., Sioux Falls, S. D.
United States Register Co., Battle Creek, Mich.
Viking Mfg. Corp., Cleveland, O.
Williamson Co., Cincinnati, O.
York Corp., York, Pa. (Spiral conduit for high pressure air distribution)

DUCTS AND DUCT FITTINGS, PREFABRICATED, NON-FLEXIBLE, NON-METALLIC

American Agile Corp., Bedford, O.
Colonial Plastics Mfg. Co., Cleveland, O. (Unplasticized polyvinyl chloride)
du Pont de Nemours & Co., E. I., Fabrics & Finishes Dept., Wilmington, Del.
Flexible Tubing Corp., Guilford, Conn.
General Ceramics Corp., Keasbey, N. J.
Goethel Sheet Metal Wks., Inc., Alfred, Milwaukee, Wis.
Haveg Corp., Newark, Del. (for fumes)
Heil Process Equipment Corp., Cleveland, O.
Johns-Manville, New York, N. Y.
Knight, Maurice A., Akron, O. (acid-proof)
Lumm Co., A. H., Toledo, O.
Permacrete Products, Columbus, O. (prefabricated concrete forms, also for flooring and roofing)
Robinson Clay Product Co., The, Akron, O.
United States Rubber Co., New York, N. Y.

DYE PENETRANT

See Penetrant, Dye

DUST COLLECTORS

See Collectors, Dust

DUST COUNTERS

See Counters, Dust

ECONOMIZERS, FUEL

Babcock & Wilcox Co., New York, N. Y.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Combustion Engineering, Inc., New York, N. Y.
Edge Moor Iron Works, Inc., Edge Moor, Del.
Foster Wheeler Corp., New York, N. Y.
Green Fuel Economizer Co., Beacon, N. Y.
Richmond Engineering Co., Richmond, Va.
Springfield Boiler Co., Springfield, Ill.
Union Iron Works, Erie, Pa.

EJECTORS, SEWAGE

American-Marsh Pumps, Inc., Battle Creek, Mich.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davidson Co., M. T., New York, N. Y.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Nash Engineering Co., South Norwalk, Conn.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Swaby Mfg. Co., Chicago, Ill.
Weil Pump Co., Chicago, Ill.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Yeomans Bros. Co., Melrose Park, Ill.

ELBOWS, BALANCING, FOR HOT WATER HEATING SYSTEMS

Detroit Controls Corp., Detroit, Mich.
Dunham Co., C. A., Chicago, Ill.
G & H Mfg. Co., Philadelphia, Pa.
Hammond Brass Works, Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kehm Corp., The, Chicago, Ill.
New York Brass Foundry, New York, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

ELECTRIC AIR CLEANERS

See Cleaners, Air, Electrical

ELECTRIC DRILLS

See Drills, Electric, Portable

ELECTRIC MOTORS

See Motors, Electric

ELECTRIC PIPE HEATING SYSTEMS

See Systems, Electric Pipe Heating

ELECTRIC RADIANT HEATING

See Conductors and Panels, Electrical, for Radiant Heating

ELECTRIC SHEARS

See Shears, Electric, Portable

ELECTRIC UNIT HEATERS

See Heaters, Unit, Electric Heating Element

ELECTRIC WATER HEATERS

See Heaters, Water, Electric

ELECTRICAL AIR FILTERS

See Cleaners, Air, Electrical

ELECTRODES, ARC WELDING

Air Reduction Sales Co., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allegheny Ludlum Steel Corp., Pittsburgh, Pa. (Stainless)
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alloy Rods Co., York, Pa.
American Brass Co., Waterbury, Conn.
American Steel & Wire Div., United States Steel, Cleveland, O.
Arcos Corp., Philadelphia, Pa.
Burdett Oxygen Co. of Calif., Huntington Park, Calif.
Central Steel & Wire Co., Chicago, Ill.
Crucible Steel Co. of America, Pittsburgh, Pa.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Harnischfeger Corp., Milwaukee, Wis.
Hobart Bros. Co., Troy, O.
International Nickel Co., Inc., The, New York, N. Y.
Laclede Steel Co., St. Louis, Mo.
Lincoln Electric Co., Cleveland, O.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Maurath, Inc., Cleveland, O.
McKay Co., Pittsburgh, Pa.
Metal & Thermit Corp., New York, N. Y.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif. (for hard facing)
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National Cylinder Gas Co., Chicago, Ill.
Page Steel & Wire Division of American Chain & Cable Co., Inc., Monessen, Pa.
Sight Feed Generator Co., West Alexandria, O.
Smith Corp., A. O., Milwaukee, Wis.
Trindl Products, Ltd., Chicago, Ill.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.

ELECTRODES, OIL BURNER

Auburn Sparkplug Co., Inc., Auburn, N. Y.
Crown Engineer Corp., Keyport, N. J.
Dielectric Products Co., Inc., Jersey City, N. J.
Steinen Mfg. Co., Wm., Newark, N. J.

ELECTROSTATIC AIR FILTERS

See Cleaners, Air, Electrical

ELIMINATORS, AIR, FOR HEATING AND PIPING SYSTEMS

Anderson Co., V. D., The, Cleveland, O.
Armstrong Machine Works, Three Rivers, Mich.
Bell & Gossett Co., Morton Grove, Ill.
Dole Valve Co., The, Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.
General Automatic Products Corp., Baltimore, Md.
Gorton Heating Corp., Cranford, N. J.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Keeney Mfg. Co., Newington, Conn.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Moreheat Distribution, Inc., Cincinnati, O.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Multiplex Mfg. Co., Berwick, Pa.
Quality Specialty Co., Inc., Camden, N. J.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Trane Co., The, La Crosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Wright-Austin Co., Detroit, Mich.

ELIMINATORS, SLUG, REFRIGERANT

Blazer, M. & Son, Passaic, N. J.

ENAMELS AND LACQUERS

Acorn Paint & Chemical Co., Cleveland, O.
Arco Co., The, Cleveland, O.
Atlas Powder Co., North Chicago, Ill.
Barreled Sunlight Paint Co., Providence, R. I.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (pipeline and waterworks enamels)
Blue Ridge Talc Co., Inc., Henry, Va.
Claronex Products, Inc., Brooklyn, N. Y.
Cordo Chemical Corp., Norwalk, Conn.
Debevoise Co., The, Brooklyn, N. Y.
Dixon Crucible Co., Joseph, Jersey City, N. J.
du Pont de Nemours & Co. (Inc.) E. I., Finishes Div., Wilmington, Del.
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Heresite & Chemical Co., Manitowoc, Wis. (air dry)
Hilo Varnish Corp., Div. of Carpenter-Morton Co., Everett, Mass.
Horn Co., Inc., A. C., Long Island City, N. Y.
Inter-Coastal Paint Corp., East St. Louis, Ill.
Interchemical Corp., Finishes Div., Newark, N. J.
Irvington Varnish and Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Knight, Maurice A., Akron, O.
Koppers Co., Inc., Pittsburgh, Pa.
Krehbiel Co., J. H., Chicago, Ill.
Mass & Waldstein Co., Newark, N. J.
Master Mechanics Co., Cleveland, O.
National Lead Co., New York, N. Y.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Quigley Co., Inc., New York, N. Y.
Reilly Tar & Chemical Corp., Indianapolis, Ind.
Ronor Corp., Cleveland, O. (Spray units)
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sandstrom Products Co., Port Byron, Ill.
Sherwin-Williams Co., The, Cleveland, O.
Sipe & Co., James B., Pittsburgh, Pa.
Sonneborn Sons, Inc., L., New York, N. Y.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Steelcote Mfg. Co., St. Louis, Mo.
Thompson and Co., Oakmont, Pa.
Tropical Paint Co., Cleveland, O.
Truscon Laboratories, Detroit, Mich.
United Chromium Div., Metal & Thermit Corp., New York, N. Y.
Valdura Div., American-Marietta Co., Chicago, Ill.
Warren Refining & Chemical Co., The, Cleveland, O.
Watson-Standard Co., Pittsburgh, Pa.
Wilbur & Williams Co., Brighton, Mass.
Wilhelm Co., A., Reading, Pa.

ENCLOSURES FOR PERIMETER AIR CONDITIONING SYSTEMS AND AIR CONDITIONING UNITS

Brandt & Co., Inc., Eugene J., New York, N. Y.

ENCLOSURES, RADIATOR

Brandt & Co., Inc., Eugene J., New York, N. Y.
Diamond Mfg. Co., Wyoming, Pa.
Hendrick Mfg. Co., Carbondale, Pa.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Stedco Products, Wilkes-Barre, Pa.

ENGINES, DIESEL, FOR FAN, PUMP AND COMPRESSOR DRIVES

Alco Products, Inc., Schenectady, N. Y.
Anderson Diesel Engine Co., Philadelphia, Pa.
Berry-Hill Corp., Hill Diesel Engine Div., Providence, R. I.
Buda Div., Allis-Chalmers Mfg. Co., Harvey, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Detroit Diesel Engine Div., General Motors Corp., Detroit, Mich.
Fairbanks, Morse & Co., Chicago, Ill.
Hamilton Div., Baldwin-Lima-Hamilton Corp., Hamilton, O.
Harnischfeger Corp., Milwaukee, Wis.
Ingersoll-Rand Co., New York, N. Y.
Ready-Power Co., The, Detroit, Mich.
Synchro-Start Products, Inc., Skokie, Ill. (automatic controls to start, stop and protect internal combustion engines)
Waukesha Motors Co., Waukesha, Wis.
Witte Engine Works, Oil Well Supply Div., United States Steel Co., Kansas City, Mo.
Worthington Corp., Harrison, N. J.

ENGINES, GAS, FOR FAN, PUMP AND COMPRESSOR DRIVES

Buda Div., Allis-Chalmers Mfg. Co., Harvey, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Fairbanks Morse & Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Ready-Power Co., The, Detroit, Mich.
Synchro-Start Products, Inc., Skokie, Ill. (automatic controls to start, stop and protect internal combustion engines)
Waukesha Motor Co., Waukesha, Wis.
Witte Engine Works, Oil Well Supply Div., United States Steel Co., Kansas City, Mo.
Worthington Corp., Harrison, N. J.

ENGINES, STEAM, FOR FAN, PUMP AND COMPRESSOR DRIVES

Skinner Engine Co., Erie, Pa.
Troy Engine & Machine Co., Troy, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Wachs Co., E. H., The, Chicago, Ill.
Westinghouse Electric Corp., Pittsburgh, Pa.

EQUIPMENT, BALANCING

Bear Mfg. Co., Industrial Div., Rock Island, Ill. (dynamic)
Gisholt Machine Co., Madison, Wis.
Olsen Testing Machine Co., Tinius, Willow Grove, Pa.

EVAPORATIVE CONDENSERS

See Condensers, Refrigerating, Evaporative

EVAPORATIVE COOLERS

See Units, Air Conditioning, Summer, Evaporative Cooling Type

EVAPORATORS

See Chillers, Water

EXCHANGERS, HEAT

Acme Industries, Inc., Jackson, Mich.
Adams Co., Inc., R. P., Buffalo, N. Y. (liquid to gas)
Aerco Corp., Northvale, N. J.
Aerofin Corp., Syracuse, N. Y.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
Aluminum Co., of America, Pittsburgh, Pa.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Armstrong Co., Richard M., Westchester, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Beltran Associates, Inc., Brooklyn, N. Y.
Biggs Boiler Wks., Co., The, E. Akron, O.
Binks Mfg. Co., Chicago, Ill.
Blaw Knox Co., Buflovak Equipment Div., Buffalo, N. Y.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Buxton Mfg. Co., Dover, N. J.
Cleaver-Brooks Co., Milwaukee, Wis.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. Y.
Corning Glass Works, Corning, N. Y.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering Inc., Somerville, Mass.
Davis Engineering Corp., Elizabeth, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.

Drying Systems, Inc., Chicago, Ill.
Duriron Co., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Edwards Engineering Corp., Pompton Plains, N. J.
Electric Steel Foundry Co., Portland, Ore.
Fedders-Quigan Corp., Buffalo, N. Y.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Foster Wheeler Corp., New York, N. Y.
Frick Co., Waynesboro, Pa.
Gabriel Boiler & Fabrication Co., Portland, Ore.
General Ceramics Corp., Keasbey, N. J. (Impervious Graphite)
General Fittings Co., East Greenwich, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Gilbert Brass Foundry Co., St. Louis, Mo.
Graham Mfg. Co., Inc., New York, N. Y.
Graver Water Conditioning Co., New York, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heat-Exchangers, Inc., Chicago, Ill.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Heil Process Equipment Corp., Cleveland, O.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Industrial Filter & Pump Co., Chicago, Ill.
Joy Mfg. Co., Pittsburgh, Pa.
Kaiser Co., E. B., Glenview, Ill.
Kellogg Co., M. W., The, New York, N. Y.
Kewanee-Ross Corp., Kewanee, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Kopperman & Sons, Joseph, Philadelphia, Pa.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lindy Heaters, Inc., New York, N. Y.
Madden Corp., The, Chicago, Ill.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Manning & Lewis Engineering Co., Newark, N. J.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Mueller Brass Co., Port Huron, Mich.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National Pipe Bending Co., New Haven, Conn.
Natonal-U. S. Radiator Corp., The, Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Nooter Corp., St. Louis, Mo.
Novelty Steam Boiler Works, Inc., Baltimore, Md.
Olin Mathieson Chemical Corp., Metals Div., New York, N. Y. (roll bonded panels incorporating fluid passages)
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Quaid Fabrications, Inc., Philadelphia, Pa.
Refrigeration Appliances, Inc., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Schaub Engineering Co., Fred H., Chicago, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Sims Co., Erie, Pa.
Smith Corp., A. O., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Struthers Wells Corp., Titusville, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taco Heaters, Inc., Cranston, R. I.
Techniflex Corp., Port Jervis, N. Y.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Thermo-Wheel, Inc., Far Rockaway, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Tranter Mfg., Inc., Lansing, Mich.
Union Iron Works, Erie, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
United States Air Conditioning Corp., Minneapolis, Minn.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vapor Heating Corp., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Whitlock Mfg. Co., Hartford, Conn.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., Bronx, N. Y.

EXCHANGERS, HEAT, REFRIGERANT SUCTION LINE

Acme Industries, Inc., Jackson, Mich.
Armstrong Co., Richard M., Westchester, Pa.
Brown Fintube Co., The, Elyria, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Dole Refrigerating Co., Chicago, Ill.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Frick Co., Waynesboro, Pa.
Gerstein & Cooper Co., Inc., South Boston, Mass.
Heat-Exchangers, Inc., Chicago, Ill.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Kaiser Co., E. B., Glenview, Ill.
Kramer Trenton Co., Trenton, N. J.
Marlo Coil Co., St. Louis, Mo.
Mueller Brass Co., Port Huron, Mich.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Super Radiator Corp., Minneapolis, Minn.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Temprite Products Corp., Birmingham, Mich.
Trane Co., The, La Crosse, Wis.
Tranter Mfg. Inc., Lansing, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.

EXHAUST HEADS

See Heads, Exhaust, for Pipe Lines

EXHAUST VENTILATION FITTINGS

See Fittings, Exhaust, Garage, for Attaching Car Exhaust Pipe

EXHAUSTERS, WELDING FUME

Aladdin Heating Corp., San Leandro, Calif.
Allington & Curtis Mfg. Co., Saginaw, Mich.
American Blower Corp., Detroit, Mich.
American Machine Products Co., Marshalltown, Ia.
Ammerman Co., C. L., Minneapolis, Minn.
Bertram Co., Harvey P., The, Cincinnati, O.
Black Mfg. Co., Harrison, N. J.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Chelsea Products, Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Coppus Engineering Corp., Worcester, Mass.
Dana Fan & Blower Corp., Cincinnati, O.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Gallaher Co., The, Omaha, Neb. & Owatonna, Minn.
General Blower Co., Morton Grove, Ill.
Jenn-Air Products Co., Indianapolis, Ind.
Kirk & Blum Mfg. Co., Cincinnati, O.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
Mine Safety Appliances Co., Pittsburgh, Pa.
Peters-Dalton, Inc., Detroit, Mich.
Ruemelin Mfg. Co., Milwaukee, Wis.
Torit Mfg. Co., St. Paul, Minn.
Utility Fan Corp., Los Angeles, Calif.
Wing Mfg. Co., L. J., Linden, N. J.
Wind-Way Fan & Ventilator Co., New Orleans, La.

EXPANDERS, TUBE

Chicago Pneumatic Tool Co., New York, N. Y.
Crane Packing Co., Chicago, Ill.
Elliott Co., Jeannette, Pa.
Key Co., East St. Louis, Ill.
Talon Tools, Inc., North Arlington, N. J.
Vernon Tool Co., Ltd., Alhambra, Calif.
Wilson, Inc., Thomas C., Long Island City, N. Y.

EXPANSION BENDS

See Bends, Expansion

EXPANSION BOLTS

See Bolts, Expansion

EXPANSION JOINTS

See Joints, Pipe Expansion

EXPANSION TANKS

See Tanks, Expansion, for Hot Water Heating Systems

EXPANSION VALVES

See Valves, Refrigeration

EXTENSIONS, FURNACE, WATER WALL, FOR BOILERS

Crotty Mfg. Corp., Flushing, L. I., N. Y.

EXTRACTORS, PIPE

Chicago Specialty Mfg. Co., Chicago, Ill.
Greenfield Tap & Die Corp., Greenfield, Mass.
Ridge Tool Co., Elyria, O.
Roddick Tool Co., Anaheim, Calif.
Walton Co., Hartford, Conn.

FABRICATED PIPING

See Bends; Headers; etc.

FABRICATORS, PIPE

See Headers, Pipe, Welded; and Coils, Pipe

FAN BALANCING EQUIPMENT

See Equipment, Balancing

FAN BASES

See Bases and Pads, Vibration Isolating

FAN BLADES

See Blades, Propeller Fan

FAN-COIL UNITS

See Units, Air Conditioning, Year Around, Fan-Coil Type

FAN HOUSINGS

See Housings, Fan, Centrifugal

FANS, AXIAL FLOW, PRESSURE TYPE

Aerovent Fan Co., Inc., Piqua, O. (Tubeaxial and vanexial)
Alloy Propeller, Zelionople, Pa. (Tubeaxial)
American Blower Corp., Detroit, Mich.
Bahnson Co., Winston-Salem, N. C. (Vaneaxial)
Bertram Co., Harvey P., The, Cincinnati, O.
Buffalo Forge Co., Buffalo, N. Y.
Chelsea Products, Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill. (tubeaxial)
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Dynamic Air Engineering, Inc., Los Angeles, Calif.
General Blower Co., Morton Grove, Ill.
Hartzell Propeller Fan Co., Piqua, O.
Ilg Electric Ventilating Co., Chicago, Ill.
International Engineering Inc., Dayton, O.
Joy Mfg. Co., Pittsburgh, Pa. (vaneaxial)
Kody Blower Co., Trenton, N. J. (tubeaxial and vaneaxial)
Lennox Industries, Inc., Marshalltown, Ia. (vaneaxial)
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
Moore Co., The, Marceline, Mo. (tubeaxial and vaneaxial)
Propellair Div., Robbins & Myers Inc., Springfield, O.
Robinson Ventilating Co., Zelionople, Pa.
South Bend Air Products, Inc., South Bend, Ind.
Stanat Mfg. Co., Inc., Long Island City, N. Y. (vaneaxial—2 to 6 in. diameter)
Trade-Wind Motorfans, Inc., Rivera, Calif.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

FANS, CENTRIFUGAL

Advance Aluminum Castings Corp., Chicago, Ill.
Air Conditioning Engineering Co., Cambridge, Mass.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Air Fan Engineering Co., Los Angeles, Calif.

Airwasher Corp., Eaton Rapids, Mich.
Aladdin Heating Corp., San Leandro, Calif.
Allington & Curtis Mfg. Co., Saginaw, Mich.
Alloy Propeller, Zelionople, Pa. (Stainless Steel)
American Agile Corp., Bedford, O.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Foundry & Furnace Co., Bloomington, Ill.
American Machine Products Co., Marshalltown, Ia.
Ammerman Co., C. L., Minneapolis, Minn.
Barry Blower Co., Minneapolis, Minn.
Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
Bayley Blower Co., Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Blower Application Co., Milwaukee, Wis.
Brookside Products Co., Inc., McCordsville, Ind.
Brundage Co., The, Kalamazoo, Mich.
Buffalo Forge Co., Buffalo, N. Y.
Burdett Mfg. Co., Chicago, Ill.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Carolina Blower Co., Inc., Greensboro, N. C.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Commercialaire, Inc., Brooklyn, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Cook Co., Loren, Berea, O.
Coppus Engineering Corp., Worcester, Mass.
Day Co., The, Minneapolis, Minn.
Dayton Electric Mfg. Co., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Electrevent Fan & Mfg. Co., Chicago, Ill.
Fasco Industries, Inc., Rochester, N. Y.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Frigid, Inc., Brooklyn, N. Y.
Gallaher Co., The, Omaha, Neb.
Garden City Fan Co., Chicago, Ill.
General Blower Co., Morton Grove, Ill.
General Ceramics Corp., Keasbey, N. J. (ceramics)
Green Fuel Economizer Co., Beacon, N. Y.
Hartzell Propeller Fan Co., Piqua, O.
Hastings Air Control, Inc., Omaha, Nebr.
Ilg Electric Ventilating Co., Chicago, Ill.
International Sales Co., San Francisco, Calif.
Jackson & Church Co., Saginaw, Mich.
Jaden Mfg. Co., Hastings, Neb.
Jamieson Mfg. Co., Dallas, Tex.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
King Co. of Owatonna, The, Owatonna, Minn.
Lau Blower Co., Dayton, O.
Lehigh Fan & Blower Co., Allentown, Pa.
Lennox Industries, Inc., Marshalltown, Ia.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mahr Mfg. Co., Minneapolis, Minn.
Martin Fan & Blower Co., Chicago, Ill.
Morrison Products Inc., Cleveland, O.
Mountain States Equipment Co., Denver, Colo.
Mueller Climatrol, Milwaukee, Wis.
National Engineering & Mfg. Co., Sedalia, Mo.
New York Blower Co., Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Niagara Blower Co., New York, N. Y.
Northern Blower Co., Cleveland, O.
Palmer Mfg. Co., Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Phelps Mfg. Co., Little Rock, Ark.
Power Engineering Co., Chicago, Ill.
Prat-Daniel Corp., South Norwalk, Conn.
Reynolds Mfg. Co., The, Comstock Park, Mich.
Redmond Co., Inc., Owosso, Mich.
Revcor, Carpentersville, Ill.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Robinson Ventilating Co., Zelionople, Pa.
St. Louis Blow Pipe & Heater Co., Inc., St. Louis, Mo.
Small Motors, Inc., Chicago, Ill. (small sizes)
Standard Electric Mfg. Co., West Berlin, N. J.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Trade-Wind Motorfans, Inc., Rivera, Calif.
Trane Co., The, LaCrosse, Wis.
United Electric Co., Wichita Falls, Tex.
United States Air Conditioning Corp., Minneapolis, Minn.
Universal Electric Co., Owosso, Mich.
Utility Appliance Corp., Los Angeles, Calif.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Viking Air Conditioning Div., National-U. S. Radiator Corp., Cleveland, O.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Whitty Co., Inc., Boston, Mass.

FANS, MATERIALS HANDLING

Air Conditioning Engineering Co., Cambridge, Mass.
Air Fan Engineering Co., Los Angeles, Calif.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
Bayley Blower Co., Milwaukee, Wis.
Century Fan & Ventilator Co., Stamford, Conn.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Garden City Fan Co., Chicago, Ill.
General Blower Co., Morton Grove, Ill.
Kody Blower Co., Trenton, N. J.
Martin Fan & Blower Co., Chicago, Ill.
Peerless Electric Co., Warren, O.
Phelps Mfg. Co., Little Rock, Ark.

FANS, MECHANICAL DRAFT, FOR BOILERS

Ammerman Co., C. L., Minneapolis, Minn.
Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
Bayley Blower Co., Milwaukee, Wis.
Bertram Co., Harvey P., The, Cincinnati, O.
Bressler Engineering Service, Oregon, Ill.
Brookside Products Co., Inc., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Century Fan & Ventilator Co., Stamford, Conn.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Gallaher Co., The, Omaha, Neb.
Garden City Fan Co., Chicago, Ill.
General Blower Co., Morton Grove, Ill.
Green Fuel Economizer Co., Beacon, N. Y.
International Engineering, Inc., Dayton, O.
Kody Blower Co., Trenton, N. J.
Kol-Master Corp., Oregon, Ill.
Lehigh Fan & Blower Co., Allentown, Pa.
Martin Fan & Blower Co., Chicago, Ill.
Quickdraft Co., Canton, O.
Robinson Ventilating Co., Zelionople, Pa.
Tjernlund Mfg. Co., St. Paul, Minn.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Whitty Co., Inc., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

FANS, PROPELLER

Acme Equipment Co., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Aire-Foile Fan & Blower Co., Detroit, Mich.
Airmaster Corp., Chicago, Ill.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
Alloy Propeller, Zelionople, Pa. (Stainless Steel)
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Coolair Corp., Jacksonville, Fla.
Ammerman Co., C. L., Minneapolis, Minn.
Baldor Electric Co., St. Louis, Mo.
Bar-Brook Mfg. Co., Inc., Shreveport, La.
Belco Industries, Inc., St. Louis, Mo.
Bertram Co., Harvey P., The, Cincinnati, O.
Biglin & Co., Inc., H. C., Atlanta, Ga.
Bishop & Babcock Mfg. Co., Cleveland, O.
Broan Mfg. Co., Inc., Milwaukee, Wis.
Brookside Products Co., Inc., McCordsville, Ind.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Buffalo Forge Co., Buffalo, N. Y.
Burden Co., Alan E., Los Angeles, Calif.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Carling Turbine Blower Co., Worcester, Mass.
Carey Mfg. Co., Philip, Cincinnati, O.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. Y.
Chelsea Products, Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Commercialaire, Inc., Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
Coppus Engineering Corp., Worcester, Mass.
Dana Fan & Blower Corp., Cincinnati, O.
Dayton Electric Mfg. Co., Chicago, Ill.
De Bothezat Fans Div., American Machine & Metals, Inc., New York, N. Y.
DeVilbiss Co., The, Toledo, O.
Diehl Mfg. Co., Somerville, N. J.
Donaldson Div., Marvin D. Shafer Co., Inc., Los Angeles, Calif.
Donaldson Power Ventilator Co., North Hollywood, Calif.
Dual-Air Fan Co., South Elgin, Ill.
Dynamic Air Engineering, Inc., Los Angeles.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fasco Industries, Inc., Rochester, N. Y.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
Frigid, Inc., Brooklyn, N. Y.
Gallaher Co., The, Omaha, Nebr.
General Blower Co., Morton Grove, Ill.
Hartzell Propeller Fan Co., Piqua, O.
Hill Co., Francis, Cleveland, O.
Hunter Fan & Ventilating Co., Inc., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago, Ill.
International Engineering, Inc., Dayton, O.
Jamieson Mfg. Co., Dallas, Tex.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Kernchen Co., Chicago, Ill.
King Co. of Owatonna, The, Owatonna, Minn.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Kody Blower Co., Trenton, N. J.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Lau Blower Co., Dayton, O.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
McGraw Electric Co., Lonergan Mfg. Div., Albion, Mich.
McLarty Systems, Battle Creek, Mich.
Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Moore Co., The, Marceline, Mo.
Morrill Motors, Ft. Wayne, Ind.
Mountain States Equipment Co., Denver.
Muckle Mfg. Co., Owatonna, Minn.
Murray Co. of Texas, The, Atlanta, Ga.
Myers Electric Co., Inc., Pittsburgh, Pa.
National Engineering & Mfg. Co., Sedalia, Mo.
National Gas Equipment Co., Inc., Denison, Tex.
New York Blower Co., Chicago, Ill.
Peerless Electric Co., Warren, O. (Disc)
Perkins & Son, Inc., B. F., Holyoke, Mass.
Phelps Mfg. Co., Little Rock, Ark.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Propellair Div., Robbins & Myers, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans, La.
Reynolds Electric Co., River Grove, Ill.
Rich Fan Mfg. Co., Inc., Phil, Houston, Texas
Robbins & Myers, Inc., Fan Div., Memphis, Tenn.
Robinson Ventilating Co., Zelionople, Pa.
St. Louis Blow Pipe & Heater Co., Inc., St. Louis, Mo.
Schwitzer-Cummins Co., Indianapolis, Ind.
Signal Electric Div. of King-Seeley Corp., Menominee, Mich.
Somers, Inc., H. J., Detroit, Mich.
South Bend Air Products, Inc., South Bend, Ind.
Standard Electric Mfg. Co., West Berlin, N. J.

Sutton Corp., O. A., The, Wichita, Kan.
Swift Mfg. Co., Inc., Royal Oak, Mich.
Thermal Industries, Indio, Calif.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Trade-Wind Motorfans, Inc., Rivera, Calif.
Trane Co., The, LaCrosse, Wis.
Truflow Fan Co., Harmony, Pa.
United Electric Co., Wichita Falls, Tex.
United States Air Conditioning Corp., Minneapolis, Minn.
Viking Air Conditioning Div., National-U. S. Radiator Corp., Cleveland, O.
Western Blower Co., Seattle, Wash.
Western Engineering & Mfg. Co., Venice, Calif.
Wind-Way Fan & Ventilating Co., New Orleans, La.
Wing Mfg. Co., L. J., Linden, N. J.

FASTENERS, INSULATION

Acme Steel Co., Chicago, Ill (steel strapping)
Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Gerrard & Co., A. J., Melrose Park, Ill.
Graham Mfg. Corp., Royal Oak, Mich.
Huck Mfg. Co., Detroit, Mich.
Johns-Manville, New York, N. Y.
Lexsuco, Inc., Cleveland, O.
Moore, Inc., Goodloe, E., Danville, Ill.
Miracle Adhesives Corp., New York, N. Y.
Nelson Stud Welding Div., Gregory Industries Inc., Lorain, O.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., Cleveland, O. (powder-actuated)
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.
Tinnerman Products, Inc., Cleveland, O.

FASTENERS, POWDER OPERATED

Powder Power Tool Corp., Portland, Ore.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., Cleveland, O.
Remington Arms Co., Inc., Bridgeport, Conn.
Tempo Products Co., Cleveland, O.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.

FEEDERS, CHEMICAL, PROPORTIONING

American Water Softener Co., Philadelphia, Pa.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Calgon, Inc., Pittsburgh, Pa.
Chemical Engineering Co., Dallas, Tex.
Cochrane Corp., Philadelphia, Pa.
Dearborn Chemical Co., Chicago, Ill.
Elgin Softener Corp., Elgin, Ill.
Fischer & Porter Co., Hatboro, Pa.
Graver Water Conditioning Co., New York, N. Y.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hungerford & Terry, Inc., Clayton, N. J.
Madden & Co., P. E., Chicago, Ill.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Myers & Bros. Co., F. E., The, Ashland, O.
Omega Machine Co., Div., of B-I-F Industries, Inc., Providence, R. I. (liquid and dry)
Permutit Co., New York, N. Y.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Research Appliance Co., Pittsburgh, Pa.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Syntron Co., Homer City, Pa.
Wallace & Tiernan, Inc., Belleville, N. J.

FEEDERS, WATER, HEATING BOILER

Acker Organization, Inc., W. M., Meridian, Miss.
Bailey Co., Chas. M., San Francisco, Calif.
Calgon, Inc., Pittsburgh, Pa.
Campbell Co., J. A., Long Beach, Calif.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Davis Regulator Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Kieley & Mueller, Inc., Middletown, N. Y.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Magnetrol, Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Morehead Mfg. Co., Detroit, Mich.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Nason Co., Clarkston, Mich.
Penn Controls, Inc., Goshen, Ind.
Schaub Engineering Co., Fred H., Chicago, Ill.
Squires Co., C. E., The, Cleveland, O.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

FEEDWATER HEATERS

See Deaerators

FIBER PACKING

See Packing, Fiber

FIBER PIPE

See Pipe, Fiber

FILTER GAGES

See Gages, Air Filter

FILTER OILS

See Oils, for Coating Viscous Air Filters

FILTERS, AIR, AUTOMATIC

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Air-Maze Corp., Cleveland, O.
Air-Stream Filter Corp., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
Bahnson Co., Winston-Salem, N. C.
Continental Air Filters, Inc., Louisville, Ky.
Day Co., The, Minneapolis, Minn.
Dollinger Corp., Rochester, N. Y.
Farr Co., Los Angeles, Calif.
Gray Co., Inc., Minneapolis, Minn.
Hanna Engineering Wks., Chicago, Ill.
Leavitt Machine Co., Orange, Mass.
Ruemelin Mfg. Co., Milwaukee, Wis.
Trion, Inc., McKees Rocks, Pa.

FILTERS, AIR, ELECTRIC

See Cleaners, Air, Electrical

FILTERS, AIR, ELECTRICAL

See Cleaners, Air, Electrical

FILTERS, AIR, ELECTROSTATIC

See Cleaners, Air, Electrical

FILTERS, AIR, GREASE

Air Devices, Inc., New York, N. Y.
Air Filter Corp., Milwaukee, Wis.
Air-Maze Corp., Cleveland, O.
Air-Stream Filter Corp., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
Continental Air Filters, Inc., Louisville, Ky.
Cuno Engineering Co., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Evans Corp., The, George, Moline, Ill.
Farr Co., Los Angeles, Calif.
Research Products Corp., Madison, Wis.
Smith Filter Corp., Moline, Ill. (Aluminum)
Trion, Inc., McKees Rocks, Pa.
Vortox Co., Claremont, Calif.

FILTERS, AIR, UNIT, CLEANABLE

Air Devices, Inc., New York, N. Y.
Air Filter Corp., Milwaukee, Wis.
Air-Maze Corp., Cleveland, O.
Air-Stream Filter Corp., St. Louis, Mo.
Aluminum Wool Div., Carey Electronic Engineering Co., Springfield, O.
American Air Filter Co., Inc., Louisville, Ky.
Annis Air Filter Div., Royal Heaters, Inc., Alhambra, Calif.
Bard Mfg. Co., Bryan, O.
Besser Metal Products Corp., Charlotte, N. C.
Carey Electronic Engineering Co., Metal Wool Div., Springfield, O.
Celanese Corp. of America, New York, N. Y.
Continental Air Filters, Inc., Louisville, Ky.
Coppus Engineering Corp., Worcester, Mass.
Dollinger Corp., Rochester, N. Y.
Electro-Air Cleaner Co., Pittsburgh, Pa.
Evans Corp., The, George, Moline, Ill.
Farr Co., Los Angeles, Calif.
Goodyear Tire & Rubber Co., Akron, O.
Kaye & McDonald, Inc., West Orange, N. J.
Microtron Corp., Charlotte, N. C.
Peden Equipment Co., Houston, Texas
Research Products Corp., Madison, Wis.
Somers, Inc., H. J., Detroit, Mich.
Smith Filter Corp., Moline, Ill. (Aluminum)
Stoddard Industries, Inc., Chicago, Ill.
Trion, Inc., McKees Rocks, Pa.
Vortox Co., Claremont, Calif.

FILTERS, AIR, UNIT, RENEWABLE MEDIA

Air-Maze Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
Annis Air Filter Div., Royal Heaters, Inc., Alhambra, Calif.
Cambridge Filter Corp., Syracuse, N. Y.
Continental Air Filters, Inc., Louisville, Ky.
Cuno Engineering Co., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Drico Industrial Corp., Passaic, N. J.
Filt-R-Ite Co., Chicago, Ill.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Research Products Corp., Madison, Wis.
Trion, Inc., McKees Rocks, Pa.

FILTERS, AIR, UNIT, THROW-AWAY

Airgard Mfg. Co., Chicago, Ill.
Air-Stream Filter Corp., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
Bowman Co., D. F., New Albany, Ind. (Special sizes)
Cambridge Filter Corp., Syracuse, N. Y. (absolute filters)
Cuno Engineering Co., Meriden, Conn.
Drico Industrial Corp., Passaic, N. J.
Filt-R-Ite Co., Chicago, Ill.
Flanders Mill, Inc., Riverhead, Long Island, N. Y.
Mine Safety Appliances Co., Pittsburgh, Pa.
Owens-Corning Fiberglas Corp., Toledo, O.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Process Development, Inc., Genoa, O.
Research Products Corp., Madison, Wis.
Standard Asbestos Mfg. Co., Chicago, Ill.
Wilson & Co., Inc., Chicago, Ill.

FILTERS FOR OIL BURNERS

A-P Controls Corp., Milwaukee, Wis.
Andale Co., Philadelphia, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Commercial Filters Corp., Melrose, Mass.
Cuno Engineering Corp., Meriden, Conn.
Eddington Metal Specialty Co., Eddington, Pa.
Fram Corp., Providence, R. I.
General Filters, Inc., Novi, Mich.
Hauck Mfg. Co., Brooklyn, N. Y.
Hilliard Corp., Elmira, N. Y.
Marquart Mfg. Co., Oakland, Calif.
Marvel Engineering Co., Chicago, Ill.
Meldon Industries Div., Tool Industries, Inc., Detroit, Mich.
Morse-Smith-Morse Co., The, Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Purolator Products, Inc., Rahway, N. J.
Rega Mfg. Co., Rochester, N. Y.
Sparkler Mfg. Co., Mundelein, Ill.
Unifilter Co., Farmington, Mich.
W. G. B. Oil Clarifier, Inc., Kingston, N. Y.
Winslow Engineering Co., Oakland, Calif.

FILTERS, ODOR

See Adsorbers, Odor

FILTERS, PIPE LINE

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
A-P Controls Corp., Milwaukee, Wis.
Adams Co., Inc., R. P., Buffalo, N. Y.
Air-Maze Corp., Cleveland, Ohio.
Alco Products, Inc., Schenectady, N. Y.
Alco Valve Co., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
American Cyanamid & Chemical Corp., New York, N. Y.
American Meter Co., Inc., Philadelphia, Pa.
Andale Co., Philadelphia, Pa.

Anderson Co., V. D., The, Cleveland, O.
CCA Products, Inc., Glendale, Calif.
Commercial Filters Corp., Melrose, Mass.
Conoflow Corp., Philadelphia, Pa.
Cuno Engineering Corp., Meriden, Conn.
DeVilbiss Co., The, Toledo, O.
Dollinger Corp., Rochester, N. Y.
Eddington Metal Specialty Co., Eddington, Pa.
Emco Pneumatic Corp., Des Moines, Ia.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Fisher Governor Co., Marshalltown, Ia.
Fram Corp., Providence, R. I.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Filters, Inc., Novi, Mich.
Johnson Corp., The, Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
Kraissl Co., Inc., The, Hackensack, N. J.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Marvel Engineering Co., Chicago, Ill.
Micro Metallic Corp., Glen Cove, N. Y.
Moraine Products Div., General Motors Corp., Dayton, O. (Porous metal)
Newark Wire Cloth Co., Newark, N. J.
Norgren Co., C. A., Englewood, Colo.
Norwalk Valve Co., South Norwalk, Conn.
Porous Plastic Filter Co., Glen Cove, N. Y.
Roylyn, Inc., Glendale, Calif.
Scientific Instrument Co., Detroit, Mich.
Selas Corp., of America, Philadelphia, Pa.
Standard Machine & Mfg. Co., St. Louis, Mo.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Trerice Co., Detroit, Mich.
Unifilter Co., Farmington, Mich.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Watts Regulator Co., Lawrence, Mass.
Winslow Engineering Co., Oakland, Calif.
Worthington Corp., Harrison, N. J.

FILTERS, REFRIGERANT

A-P Controls Corp., Milwaukee, Wis.
Alco Products, Inc., Schenectady, N. Y.
Alco Valve Co., St. Louis, Mo.
Commercial Filters Corp., Melrose, Mass.
Cuno Engineering Corp., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Eddington Metal Specialty Co., Eddington, Pa.
General Filter Co., Ames, Ia.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
McIntire Co., The, Newark, N. J.
Moraine Products Div., General Motors Corp., Dayton, O. (Porous metal)
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Phillips & Co., H. A., Chicago, Ill.
Porous Plastic Filter Co., Glen Cove, N. Y.
Remco, Inc., Zelienople, Pa.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Standard Machine & Mfg. Co., St. Louis, Mo.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.

FILTERS, WATER

A-P Controls Corp., Milwaukee, Wis.
Adams Co., Inc., R. P., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Alco Valve Co., St. Louis, Mo.
American Cyanamid & Chemical Corp., New York, N. Y.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Andale Co., Philadelphia, Pa.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Austin Engineering & Mfg. Co., Inc., Ysleta (El Paso County) Texas
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Bruner Corp., Milwaukee, Wis.
Chemical Engineering Co., Dallas, Tex.
Cochrane Corp., Philadelphia, Pa.
Commercial Filters Corp., Melrose, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Cuno Engineering Corp., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Duro Co., Dayton, O.
Eddington Metal Specialty Co., Eddington, Pa.
Elgin Softener Corp., Elgin, Ill.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Graver Water Conditioning Co., New York, N. Y.
Greer Hydraulics, Inc., Jamaica, N. Y.
Henry Valve Co., Melrose Park, Ill.
Hungerford & Terry, Inc., Clayton, N. J.
Industrial Filter & Pump Co., Chicago, Ill.
Kaye & MacDonald, Inc., West Orange, N. J.
Marvel Engineering Co., Chicago, Ill.
Micro Metallic Corp., Glen Cove, N. Y.
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Norwood Associated Engineers Inc., Springfield, Mass.
Permutit Co., New York, N. Y.
Porous Plastic Filter Co., Glen Cove, N. Y.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Reynolds Shaffer Co., Detroit, Mich.
Selas Corp. of America, Philadelphia, Pa.
Sparkler Mfg. Co., Mundelein, Ill.
Stover Water Softener Co., St. Charles, Ill.
Uniflow Mfg. Co., Erie, Pa.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Winslow Engineering Co., Oakland, Calif.
Worthington Corp., Harrison, N. J.

FINNED TUBING

See Tubing, Finned

FIRE DAMPERS

See Dampers, Fire

FIRE EXTINGUISHING SYSTEMS

See Systems, Fire Extinguishing

FIRE PUMPS

See Pumps, Fire

FIRE VALVES AND VENTILATORS

See Ventilators, Roof, with Fusible Links

FITTINGS, ALUMINUM TUBE

Aircraft Fitting Co., Cleveland, O.
Crawford Fitting Co., Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Parker Appliance Co., Cleveland, O.
Roylyn, Inc., Glendale, Calif.

FITTINGS, BLOW PIPE

Allington & Curtis Mfg. Co., Saginaw, Mich.
American Blow Pipe Co., Chicago, Ill. (pipe, elbows, etc.)
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
Carolina Blower Co., Inc., Greensboro, N. C.
Chicago Metal Mfg. Co., Chicago, Ill.
Day Co., The, Minneapolis, Minn.
Goethel Sheet Metal Works, Inc., Alfred, Milwaukee, Wis.
Griffin & Co., Louisville, Ky.
Kirk & Blum Mfg. Co., Cincinnati, O.
Newcomb-Detroit Co., Detroit, Mich.
Northern Blower Co., Cleveland, O.
Peters-Dalton, Inc., Detroit, Mich.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Research Vacuum Supply Co., Chicago, Ill.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Schmieg Industries, Detroit, Mich.
Torit Mfg. Co., St. Paul, Minn.
United States Register Co., Battle Creek, Mich.
Winkler & Sons, Inc., A. E., Milwaukee, Wis.
Young & Bertke Co., Cincinnati, O.

FITTINGS AND BUSHINGS, FUEL OIL TANK; ALARMS, LIQUID LEVEL

Flagg & Co., Inc., Stanley G., Philadelphia.
Oil Equipment Mfg. Corp., New Haven, Conn.
U. S. Plug & Fitting Co., Wellington, O.
Ward Foundries, Inc., J. P., Blossburgh, Pa.

FITTINGS FOR CENTRAL VACUUM CLEANING SYSTEMS

H-P Products, Inc., Louisville, O.
Pullman Vacuum Cleaner Co., Boston, Mass.
Spencer Turbine Co., Hartford, Conn.

FITTINGS, COPPER TUBE, COMPRESSION

Acheson Mfg. Co., Rankin, Pa.
Aircraft Fittings Co., Cleveland, O.
American Brass Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Forging and Mfg. Co., Chicago, Ill.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Hays Mfg. Co., Erie, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Lunkenheimer Co., Cincinnati, O.
Madden Brass Products Co., Aurora, Ill.
Parker Appliance Co., The, Cleveland, O.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Wabash Corp., Chicago, Ill.
Weatherhead Co., Cleveland, O.

FITTINGS, COPPER TUBE, FLARED

Acheson Mfg. Co., Rankin, Pa.
Aircraft Fitting Co., Cleveland, O.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., Chicago, Ill.
Gardiner Metal Co., Chicago, Ill.
Hays Mfg. Co., Erie, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Madden Brass Products Co., Aurora, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Parker Appliance Co., The, Cleveland, O.
Phoenix Brass Fittings Corp., Irvington, N. J.
Remco, Inc., Zelienople, Pa.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Wabash Corp., Chicago, Ill.
Weatherhead Co., Cleveland, O.

FITTINGS, COPPER TUBE, SOLDER

Acheson Mfg. Co., Rankin, Pa.
American Brass Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Gardiner Metal Co., Chicago, Ill.
General Fittings Co., East Greenwich, R. I.
Grabler Mfg. Co., Cleveland, O.
Hammond Brass Works, Hammond, Ind.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y. (silver brazed)

FITTINGS, DRAINAGE, FIXED AIR BREAK

Beaton & Cadwell Mfg. Co., New Britain, Conn.
Central Foundry Co., Newark, N. J.
Crane Co., Chicago, Ill.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.

FITTINGS, EXHAUST, GARAGE, FOR ATTACHING CAR EXHAUST PIPE

American Metal Hose Div., American Brass Co., Waterbury, Conn.
Ammerman Co., C. L., Minneapolis, Minn.
Kent-Moore Organization, Inc., Detroit, Mich.
Wendt Co., O. A., Chicago, Ill.

FITTINGS, HOSE TO PIPE

Acheson Mfg. Co., Rankin, Pa.
Aeroquip Corp., Jackson, Mich.
Allen Mfg. Co., W. D., Chicago, Ill.

American Sanitary Mfg. Co., Abingdon, Ill. (for polyethylene plastic tubing)
Anchor Coupling Co., Libertyville, Ill.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dole Refrigerating Co., Chicago, Ill.
Goodall Rubber Co., Trenton, N. J.
Hewitt-Robins, Inc., Stamford, Conn.
Parker Appliance Co., Cleveland, O.
Quick Joint Div., Automatic Bending Co., Harvey, Ill. (for polyethylene plastic tubing)
Roylyn, Inc., Glendale, Calif.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Weatherhead Co., The, Cleveland, O.

FITTINGS, HOT WATER HEATING SYSTEMS, ONE PIPE

American Tube Products, Inc., Natick, R. I.
Autostributor Co., Lansing, Mich. (manifold for connecting radiator branches)
Bell & Gossett Co., Morton Grove, Ill.
Dunham Co., C. A., Chicago, Ill.
General Heaters & Regulators Co., East Chicago, Ind.
Hi-Flow Products, Inc., Copiague, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kehm Corp., The, Chicago, Ill.
Mel Products Co., The, New Haven, Conn.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sullivan Valve & Engineering Co., Butte, Mont.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.

FITTINGS, LIFT

Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

FITTINGS, LINED

American Hard Rubber Co., New York, N. Y. (Rubber)
Bart Mfg. Corp., Belleville, N. J.
Cement Lined Pipe Co., Lynn, Mass. (Lead and tin)
Chemical Coatings & Engineering Co., Edgemont, Pa.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Gates Engineering Co., Wilmington, Del.
General Ceramics Corp., Keasbey, N. J. (ceramics & graphite)
Goodrich Co., B. F., Akron, O. (Rubber)
Heil Process Equipment Corp., Cleveland, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin)
Marquette Coppersmithing Co., Philadelphia, Pa.
Michigan Pipe Co., Gagetown, Mich. (Wood, saran rubber)
National Lead Co., New York, N. Y. (Lead)
Northern Indiana Brass Co., Elkhart, Ind. (Tinned)
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (lead)
Saran Lined Pipe Co., Ferndale, Mich.
United States Rubber Co., New York, N. Y. (Rubber)
Warren Foundry & Pipe Corp., New York, N. Y. (cement)

FITTINGS, PIPE, ALUMINUM

Aircraft Fitting Co., Cleveland, O.
Aluminum Co. of America, Pittsburgh, Pa.
Anchor Coupling Co., Libertyville, Ill.
Ladish Co., Cudahy, Wis.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Robinson Corp., Roselle Park, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering, Youngstown, O.

FITTINGS, PIPE, BRASS, THREADED

Acheson Mfg. Co., Rankin, Pa.
Aeroquip, Inc., Van Wert, O.
Aircraft Fitting Co., Cleveland, O.
American Manganese Bronze Co., Philadelphia, Pa.
American Sanitary Mfg. Co., Abingdon, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., The, Chicago, Ill.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Flodar Corp., Cleveland, O.
Gilbert Brass Foundry Co., St. Louis, Mo.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Imperial Brass Mfg. Co., Chicago, Ill.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Leavitt Machine Co., Orange, Mass.
Madden Brass Products Co., Aurora, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Moran Flexible Joint Co., Louisville, Ky.
New York Brass Fdry., New York, N. Y.
Parker Appliance Co., Cleveland, O.
Penn Mfg. Corp., of Washington, Pa., Washington, Pa.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Union Metal Wks., Chelsea, Mass.
Weatherhead Co., The, Cleveland, O.

FITTINGS, PIPE, BRASS, WELDING

Chase Brass & Copper Co., Waterbury, Conn.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Robinson Corp., Roselle Park, N. J.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y. (Brazed)

FITTINGS, PIPE, BRONZE, BRAZED

Acheson Mfg. Co., Rankin, Pa.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Union Metal Works, Chelsea, Mass.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, BRONZE, SOLDER

Acheson Mfg. Co., Rankin, Pa.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
General Fittings Co., East Greenwich, R. I.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Hi-Flow Products, Inc., Copiague, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Moran Flexible Joint Co., Louisville, Ky.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Union Malleable Mfg. Co., Ashland, O.
Union Metal Works, Chelsea, Mass.

FITTINGS, PIPE, CAST IRON, FLANGED

Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Frick Co., Waynesboro, Pa.
Goodall Rubber Co., Trenton, N. J.
Grinnell Co., Inc., Providence, R. I.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kuhns Bros. Co., Dayton, O.
Leavitt Machine Co., Orange, Mass.
Malleable Iron Fittings Co., Branford, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Parks-Cramer Co., Fitchburg Mass. (Jacketed)
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Stockham Valves & Fittings Co., Birmingham, Ala.
United States Pipe & Foundry Co., Birmingham, Ala.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.
Warren Foundry & Pipe Corp., New York.
York Corp., York, Pa.

FITTINGS, PIPE, CAST IRON, THREADED

Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Frick Co., Waynesboro, Pa.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kuhns Bros. Co., Dayton, O.
Leavitt Machine Co., Orange, Mass.
Malleable Iron Fittings Co., Branford, Conn.
Ravena Iron Co., Ravena, N. Y.
Stockham Valves & Fittings Co., Birmingham, Ala.
U. S. Plug & Fitting Co., Wellington, O. (pipe plug)
Union Malleable Mfg. Co., Ashland, O.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Zurn Mfg. Co., J. A., Erie, Pa.
York Corp., York, Pa.

FITTINGS, PIPE, COMPRESSION

Aircraft Fitting Co., Cleveland, O.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Hays Mfg. Co., Erie, Pa.
Quick Joint Div., Automatic Bending Co., Harvey, Ill.
York Corp., York, Pa.

FITTINGS, PIPE, HARD RUBBER

American Hard Rubber Co., New York, N. Y.
Cooper Alloy Corp., Hillside, N. J.
Goodrich Co., B. F., Akron, O.
Luzerne Rubber Co, Trenton, N. J.
United States Rubber Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J.

FITTINGS, PIPE, JACKETED

Albert Pipe Supply Co., Brooklyn, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Youngstown Welding & Engineering, Youngstown, O.

FITTINGS, PIPE, LEAD

Alpha Metals, Inc., Jersey City, N. J.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Heil Process Equipment Corp., Cleveland, O.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Leavitt Machine Co., Orange, Mass.
National Lead Co., New York, N. Y.
Northwest Lead Co., Seattle, Wash.
Resisto Pipe & Valve Co., East Cambridge, Mass.
Rochester Lead Works, Inc., Rochester, N. Y.

FITTINGS, PIPE, MALLEABLE

Corley Co., Inc., The, Jersey City, N. J.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Fanner Mfg. Co., The, Cleveland, O.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Kennedy Valve Mfg. Co., Elmira, N. Y.

Malleable Iron Fittings Co., Branford, Conn.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Rhode Island Fittings Co., Providence, R. I.
Stockham Valves & Fittings Co., Birmingham, Ala.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Union Malleable Mfg. Co., Ashland, O.
Union Pipe Fitting Co., Fort Atkinson, Wis.
Walworth Co., New York, N. Y.
Ward Foundries, Inc. J. P., Blossburgh, Pa.
York Corp., York, Pa.

FITTINGS, PIPE, MALLEABLE, BRAZED

Flagg & Co., Inc., Stanley G., Philadelphia, Pa.

FITTINGS, PIPE, NICKEL AND NICKEL ALLOY

American Manganese Bronze Co., Philadelphia, Pa.
Bart Mfg. Co., Belleville, N. J.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Hasco Valve & Machine Co., Milwaukee, Wis.
International Nickel Co., Inc., The, New York, N. Y.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Robinson Corp., Roselle Park, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering, Youngstown, O.

FITTINGS, PIPE, NICKEL PLATED

Acheson Mfg. Co., Rankin, Pa.
Bart Mfg. Co., Belleville, N. J.
Quick Joint Div., Automatic Bending Co., Harvey, Ill.
Taylor Forge & Pipe Wks., Chicago, Ill.

FITTINGS, PIPE, PLASTIC

Albert Pipe Supply Co., Brooklyn, N. Y.
Alpha Plastics, Inc., W. Orange, N. J. (PVC)
American Agile Corp., Bedford, O.
American Hard Rubber Co., New York, N. Y.
Anesite Co., Chicago, Ill.
Associated Plastic Co's., Inc., Midland, Mich. (rigid polyvinyl)
Atlas Mineral Products Co., Mertztown, Pa.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Carlon Products Corp., Cleveland, O.
Cheaflex Corp., Yonkers, N. Y.
Colonial Plastics Mfg. Co., Cleveland, O.
Commercial Plastics Co., Chicago, Ill.
Continental Can Co., Millsplastic Pipe Div., New York, N. Y.
Continental-Diamond Fibre Co., Newark, Del.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Crescent Plastics, Inc., Evansville, Ind.
Franklin Plastics, Inc., Franklin, Pa.
Goodrich Co., B. F., Akron, O.
Grinnell Co., Inc., Providence, R. I.
Hartwell & Son, Inc., H. N., Boston, Mass. (PVC)
Haveg Corp., Newark, Del.
Industrial Plastic Fittings Co., Cleveland, O.
Manufacturers Corp., Mansfield, O.
Protective Closures Co., Inc., Buffalo, N. Y. (cap and plug closures)
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Philadelphia, Pa.
Reflin Co., San Diego, Calif. (rigid, reinforced with glass fibers)
Republic Steel Corp., Cleveland, O.
Richland Co., Mansfield, O.
Robinson Clay Product Co., The, Akron, O.
S & C Mfg. Co., Cincinnati, O.
Saran Lined Pipe Co., Ferndale, Mich.
Seelye Craftsman, Minneapolis, Minn.
Skyline Industries, Titusville, Pa.
Southwestern Plastic Pipe Co., Mineral Wells, Tex.
Stokes Molded Products, Trenton, N. J. (unplasticized polyvinyl chloride)
Stokes Molded Products Div., The Electric Storage Battery Co., c/o Geare-Marston, Inc., Philadelphia, Pa.
Tenco, Inc., Winona, Minn.
Texas Vitrified Pipe Co., Mineral Wells, Tex.
Triangle Conduit & Cable Co., Plastic Products Div., Inc., New Brunswick, N. J.
Tube Turns Plastics, Inc., Louisville, Ky. (injection molded PVC, and others)
United States Stoneware Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J.
Walworth Co., New York, N. Y.
Wilmington Plastics Co., Wilmington, Del.
Yardley Plastics Co., Columbus, O.

FITTINGS, PIPE, SADDLE TEE

Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Ladish Co., Cudahy, Wis.
Skinner Co., M. B., South Bend, Ind.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.

FITTINGS, PIPE, SANITARY

Acheson Mfg. Co., Rankin, Pa.
Central Foundry Co., Newark, N. J.
Duriron Co., Inc., The, Dayton, O. (corrosion resisting)
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Leavitt Machine Co., Orange, Mass.
Robinson Clay Product Co., The, Akron, O.
Somerville Iron Works, Inc., Chattanooga, Tenn.
Stockham Valves & Fittings Co., Birmingham, Ala.
Union Malleable Mfg. Co., Ashland, O.

FITTINGS, PIPE, SPECIAL FOR BASEBOARD RADIATION

General Fittings Co., East Greenwich, R. I. (special tee)
Hi-Flow Products, Inc., Copiague, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Northern Indiana Brass Co., Elkhart, Ind.
Rittling Corp., The, Buffalo, N. Y.
Webster & Co., Warren, Camden, N. J.

FITTINGS, PIPE, STAINLESS STEEL

Aircraft Fitting Co., Cleveland, O.
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Alloy Stainless Products Co., Totowa, N. J.
Camco Products Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Fabri-Valve Co. of America, Portland, Ore.
Flodar Corp., Cleveland, O.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Potts Co., Horace T., Philadelphia, Pa.
Pypon Co., Pittsburgh, Pa.
Robinson Corp., Roselle Park, N. J.
Stainless Welded Products, Inc., Clifton, N. J.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering, Youngstown, O.

FITTINGS, PIPE, STAINLESS STEEL, WELDING

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products, Inc., North Haven, Conn.
Clyde Tube Forgings of America, Inc., Portland, Ore.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Fabri-Valve Co. of America, Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Heat & Power Corp., Baltimore, Md.
Key Co., East St. Louis, Ill.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Pypon Co., Pittsburgh, Pa.
Robinson Corp., Roselle Park, N. J.
Stainless Welded Products, Inc., Clifton, N. J.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering Youngstown, O.

FITTINGS, PIPE, STEEL, FLANGED

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Bonney Forge & Tool Works, Allentown, Pa.
Crane Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Kerotest Mfg. Co., Pittsburgh, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Semet-Solvay Engrg Div., Allied Chemical & Dye Corp., New York, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, STEEL, FORGED, THREADED

Alpha Plastics, Inc., W. Orange, N. J. (PVC)
American Meter Co., Inc., Philadelphia, Pa.
Bonney Forge & Tool Works, Allentown, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Henry Valve Co., Melrose Park, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Larkin Packer Co., Inc., St. Louis, Mo.
Parker Appliance Co., Cleveland, O.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

FITTINGS, PIPE, STEEL, SOCKET WELD

Bonney Forge & Tool Works, Allentown, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Ladish Co., Cudahy, Wis.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

FITTINGS, PIPE, STEEL, THREADED

Bonney Forge & Tool Works, Allentown, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.

Flodar Corp., Cleveland, O.
Frick Co., Waynesboro, Pa.
Gustin Bacon Mfg. Co., Kansas City, Mo.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Henry Valve Co., Melrose Park, Ill.
Ladish Co., Cudahy, Wis.
Parker Appliance Co., The, Cleveland, O.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Tubing Seal-Cap, Inc., San Gabriel, Calif. (plugs and caps)
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

FITTINGS, PIPE, STEEL, WELDING

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bonney Forge & Tool Works, Allentown, Pa.
Crane Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Electric Steel Foundry Co., Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Gustin Bacon Mfg. Co., Kansas City, Mo.
Heat & Power Corp., Baltimore, Md.
Ladish Co., Cudahy, Wis.
Larkin Packer Co., Inc., St. Louis, Mo.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pipeline Development Co., Cleveland, O.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Walworth Co., New York, N. Y.
Youngstown Welding & Engineering, Youngstown, O.

FITTINGS, PIPE, STEEL, WELDING, SEAMLESS

Babcock & Wilcox, Tubular Products Div., Beaver Falls, Pa.
Bart Mfg. Co., Belleville, N. J. (nickel coated)
Clyde Tube Forgings of America, Inc., Portland, Ore.
Crane Co., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Northern Indiana Brass Co., Elkhart, Ind.
Special Screw Products, Bedford, O.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, WROUGHT IRON, WELDING

Albert Pipe Supply Co., Brooklyn, N. Y.
Bonney Forge & Tool Works, Allentown, Pa.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Gustin Bacon Mfg. Co., Kansas City, Mo.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.

FITTINGS, REFRIGERATION

Aero-Coupling Corp., Burbank, Calif.
Aeroquip, Inc., Van Wert, O.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Forging and Mfg. Co., Chicago, Ill.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Madden Brass Products Co., Aurora, Ill.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Remco, Inc., Zelienople, Pa.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Wabash Corp., Chicago, Ill.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Weatherhead Co., Cleveland, O.
Wittenmeier Machinery Co., Chicago, Ill.
X L Refrigerating Co., Inc., Chicago, Ill.
York Corp., York, Pa.

FITTINGS, STEEL TUBE, FLARED

Aeroquip, Inc., Van Wert, O.
Aircraft Fitting Co., Cleveland, O.
Couplings Co., Chicago, Ill.
Flodar Corp., Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Parker Appliance Co., The, Cleveland, O.
Roylyn, Inc., Glendale, Calif.
Weatherhead Co., The, Cleveland, O.

FITTINGS, STEEL TUBE, FLARELESS

Aircraft Fitting Co., Cleveland, O.
Chicago Forging and Mfg. Co., Chicago, Ill.
Crawford Fitting Co., Cleveland, O.
Flodar Corp., Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Parker Appliance Co., The, Cleveland, O.
Roylyn, Inc., Glendale, Calif.
Weatherhead Co., The, Cleveland, Ohio
Youngstown Welding & Engineering, Youngstown, O.

FLAME CONTROLS

See Controls, Flame Failure

FLAME CUTTERS

See Cutters, Flame

FLANGE BOLTS

See Bolts and Studs, Flange

FLANGE SEPARATORS

See Separators, Flange

FLANGES, ORIFICE

American Meter Co., Inc., Philadelphia, Pa.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Ladish Co., Cudahy, Wis.
Madden Corp., The, Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
New York Brass Foundry, New York, N. Y. (brass)
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Phil Rich Fan Mfg. Co., Houston, Tex.
Taylor Forge & Pipe Wks., Chicago, Ill.
Trimount Instrument Co., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.

FLANGES, PIPE, ALLOY STEEL, LAP JOINT

Alloy Steel Products Co., Linden, N. J.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, ALLOY STEEL, SCREWED

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Beaird Co., J. B., Shreveport, La.
Camco Products Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, ALLOY STEEL, WELDING

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Key Co., East St. Louis, Ill.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, ALUMINUM, WELDING

Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Pennsylvania Forge Co., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.

Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, BRASS, SCREWED

Acheson Mfg. Co., Rankin, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Providence, R. I.
Ladish Co., Cudahy, Wis.
Moran Flexible Joint Co., Louisville, Ky.
National Valve & Mfg. Co., Pittsburgh, Pa.
New York Brass Foundry, New York, N. Y.
Northern Indiana Brass Co., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Ritter Pattern & Casting Co., New York, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Union Metal Works, Chelsea, Mass.
Walworth Co., New York, N. Y.

FLANGES, PIPE, CAST IRON, SCREWED

Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Frick Co., Waynesboro, Pa.
G. & H Mfg. Co., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kuhns Bros. Co., Dayton, O.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Ravena Iron Co., Ravena, N. Y.
Ritter Pattern & Casting Co., New York, N. Y.
Stockham Valves & Fittings Co., Birmingham, Ala.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Warren Foundry & Pipe Corp., New York, N. Y.
York Corp., York, Pa.

FLANGES, PIPE, MALLEABLE IRON, SCREWED

Beaton & Corbin Mfg. Co., Southington, Conn.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Jefferson Union Co., New York, N. Y.
National Valve & Mfg. Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
York Corp., York, Pa.

FLANGES, PIPE, NICKEL AND NICKEL ALLOY

Camco Products, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Hasco Valve & Machine Co., Milwaukee, Wis.
International Nickel Co., Inc., The, New York, N. Y.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, STEEL, FORGED

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Pennsylvania Forge Co., Philadelphia, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, STEEL, LAP JOINT

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products, Inc., North Haven, Conn.
Chicago Metal Mfg. Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Welding Fitting Corp., New Castle, Pa.

FLANGES, PIPE, STEEL, SCREWED

Camco Products, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Frick Co., Waynesboro, Pa.
G & H Mfg. Co., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
U. S. Plug & Fitting Co., Wellington, O.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, STEEL, WELDING

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bonney Forge & Tool Works, Allentown, Pa.
Camco Products, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Key Co., East St. Louis, Ill.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Pennsylvania Forge Co., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Roessing Mfg. Co., Pittsburgh, Pa.
Somet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FLARED FITTINGS, COPPER TUBE

See Fittings, Copper, Tube, Flared

FLARED FITTINGS, STEEL TUBE

See Fittings, Steel Tube, Flared

FLARING TOOLS FOR TUBING

See Tools, Flaring

FLEXIBLE COUPLINGS

See Couplings, Flexible

FLEXIBLE DUCT CONNECTIONS

See Connections, Duct, Flexible

FLEXIBLE METAL HOSE

See Hose, Flexible, Metal and Fittings

FLOAT SWITCHES

See Switches, Float

FLOAT VALVES

See Valves, Float

FLOATS, STEAM TRAP, ETC.

Armstrong Machine Wks., Three Rivers, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Chicago Float Works, Not Inc., Chicago, Ill.
Clifford Mfg. Co., Div. of Standard Thompson Corp., Waltham, Mass.
Crane Co., Chicago, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.
Harris & Co., Arthur, Chicago, Ill. (all metals)
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kieley & Mueller, Inc., Middeltown, N. Y.
McAlear Mfg. Co., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Owens & Co., Inc., Henry, Cranston, R. I.
Reichert Float & Mfg. Co., Toledo, O.
Reliance Gauge Column Co., Cleveland, O.
Sarco Co., Inc., New York, N. Y.
Sterling Engineering Mfg. Corp., Hyde Park, Mass.
Trane Co., The, La Crosse, Wis.
Watson & McDaniel Co., Philadelphia, Pa.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

FLOOR AND CEILING PLATES

See Plates, Floor and Ceiling

FLOW ALARMS

See Alarms, High and Low Flow for Piping Systems

FLOW CONTROL VALVES

See Valves, Flow Control

FLOW MEASURING NOZZLES AND TUBES

See Nozzles, Flow Measuring

FLOW METERS

See Meters, Flow

FLOW SWITCHES

See Switches, Flow

FORGED STEEL VALVES

See Valves, Forged Steel

FRAMES, AIR INLET, PREFABRICATED, FOR AIR CONDITIONING UNITS

Lewis Mfg. Co., Inc., Miami, Fla.

FRESHENERS, AIR

See Adsorbers, Odor; Compounds, Air Freshening

FUEL ECONOMIZERS

See Economizers, Fuel

FUEL OIL LEAK DETECTORS

See Detectors, Leak, Fuel Oil

FUEL OIL UNITS

See Units, Fuel Oil

FUEL UNIT TESTERS

See Testers, Fuel Unit

FURNACES, DUCT

See Heaters, Duct

FURNACES, SUSPENDED

See Heaters, Air, Direct Fired

FURNACES, WARM AIR, FOR INDUSTRIAL AND LARGE BUILDING CENTRAL HEATING

(Exclusively for duct distribution of air—300,000 Btu per hr and over) For direct fired heaters, which may be located in the space heated or may be used in central plant installations with duct distribution of the air, see the listings under Heaters, Air, Direct Fired.

Air Conditioning Engineering Co., Cambridge, Mass.
Aladdin Heating Corp., San Leandro, Calif.
American Foundry & Furnace Co., Bloomington, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Armstrong Furnace Co., Columbus, O.
Auburn Foundry, Inc., Auburn, Ind.
Bard Mfg. Co., Bryan, O.
Besser Metal Products, Corp., Charlotte, N. C.
Bonair Products, Inc., Darby, Pa.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Century Engineering Corp., Cedar Rapids, Ia.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Inland Heater Corp., Minneapolis, Minn.
International Heater Co., Utica 2, N. Y.
International Sales Co., San Francisco, Calif.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corporation, Wilmington, Del.
Lennox Industries, Inc., Marshalltown, Ia.
Lennox Industries, Inc., Columbus, O.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., St. Paul, Minn.
McPherson Furnace & Supply Co., Portland, Ore.
Meyer Furnace Co., The, Peoria, Ill.
Mueller Climatrol, Milwaukee, Wis.
National Heater Co., St. Paul, Minn.
National-U. S. Radiator Corp., Johnstown, Pa.
Olson & Co., Arthur A., Canfield, O.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Ray Oil Burner Co., San Francisco, Calif.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Inc., Dowagiac, Mich.
Steel Products Engineering Co., Springfield, O.
Stewart-Warner Corp., U.S. Machine Div., Lebanon, Ind.
Surface Combustion Corp., Toledo, O.
Syncromatic Corp., Watertown, Wis.
Tjernlund Mfg. Co., St. Paul, Minn.
Universal Products Mfg. Corp., Auburn, Ind.
Waterman-Waterbury Co., The, Minneapolis, Minn.

FUSIBLE LINKS

See Links, Fusible

GAGE GLASSES

See Glasses, Gage

GAGE SETS, REFRIGERATION

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Defender Instrument & Regulator Co., St. Louis, Mo.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.

GAGE TESTERS

See Testers, Gage, Dead Weight

GAGES, AIR FILTER

Bacharach Industrial Instrument Co., Pittsburgh, Pa. (filter gauge)
Defender Instrument and Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Hays Corp., Michigan City, Ind.
Herbusch Corp., The, St. Louis, Mo. (Warning device)
Hill, E. Vernon, Chicago, Ill.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Meriam Instrument Co., The, Cleveland, O.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.

GAGES, INDICATING, DRAFT

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Canton Stoker Corp., Canton, O.
Cleveland Fuel Equipment Co., Cleveland, O.
Cole-Sewell Engineering Co., St. Paul, Minn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Illinois Testing Laboratories, Inc., Chicago, Ill.
King Engineering Corp., Ann Arbor, Mich.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Perfex Corp., Milwaukee, Wis.
Precision Scientific Co., Chicago, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.

GAGES, INDICATING, PRESSURE

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Acragage Corp., Milford, Conn.
Ashton Valve Co., Wrentham, Mass.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
Bristol Co., The, Waterbury, Conn.
Canton Stoker Corp., Canton, O.
Cleveland Fuel Equipment Co., Cleveland, O.
Control Engineering Corp., Controls Div., Norwood, Mass.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Dillon & Co., Inc., W. C., Van Nuys, Calif. (mechanical)
Dole Valve Co., The, Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport, Conn.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Longergan Co., J. E., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Meriam Instrument Co., The, Cleveland, O.
Mettler Co., Inc., The, Los Angeles, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
New York Air Valve Corp., Brooklyn, N. Y.
Norwalk Valve Co., South Norwalk, Conn.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Perfex Corp., Milwaukee, Wis.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Rochester Mfg. Co., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Wallace & Tiernan Inc., Belleville, N. J.
Weksler Thermometer Corp., New York, N. Y.

GAGES, INDICATING, VACUUM

Acragage Corp., Milford, Conn.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Ashton Valve Co., Wrentham, Mass.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Crosby Steam Gage Valve Co., Wrentham, Mass.
Defender Instrument and Regulator Co., St. Louis, Mo.
Detroit Brass & Malleable Co., Detroit, Mich.
Dickson Co., The, Chicago, Ill.
Dole Valve Co., The, Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hastings Instrument Co., Inc., Warwick, Va.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport, Conn.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Longergan Co., J. E., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
New York Air Valve Corp., Brooklyn, N. Y.
Norwalk Valve Co., South Norwalk, Conn.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Research Vacuum Supply Co., Chicago, Ill.
Republic Flow Meters Co., Chicago, Ill.
Rochester Mfg. Co., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Wallace & Tiernan Inc., Belleville, N. J.
Weksler Thermometer Corp., New York, N. Y.

GAGES, LIQUID LEVEL

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Ashton Valve Co., Wrentham, Mass.
Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Boston Auto Gage Co., Pittsfield, Mass.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Caldwell Co., W. E., Louisville, Ky.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.

Defender Instrument and Regulator Co., St. Louis, Mo.
Diamond Power Specialty Corp., Lancaster, O.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Frick Co., Waynesboro, Pa.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Henry Valve Co., Melrose Park, Ill.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Skokie, Ill.
King Engineering Corp., Ann Arbor, Mich.
Krueger Sentry Gauge Co., Green Bay, Wis.
Liquidepth Indicators, Inc., Long Island City, N. Y.
Liquidometer Corp., Long Island City, N. Y.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Marshalltown Mfg. Co., Marshalltown, Ia.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Morse-Smith-Morse, Inc., Watertown, Mass.
Nason Co., Clarkston, Mich.
New York Air Valve Corp., Brooklyn, N. Y.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Powell Co., Wm., Cincinnati, O.
Reliance Gauge Column Co., Cleveland, O.
Republic Flow Meters Co., Chicago, Ill.
Republic Mfg. Co., Cleveland, O.
Rochester Mfg. Co., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Shank Co., Cyrus, Chicago, Ill.
Simplex Valve & Meter Co., Philadelphia, Pa.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Strahman Valves, Inc., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Swift Lubricator Co., Elmira, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Visa-Test Sales Co., Burlingame, Calif.
Wallace & Tiernan Inc., Belleville, N. J.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (water)
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.
York Corp., York, Pa.

GAGES, OIL TANK

Applied Mechanics Co., Boston, Mass.
Boston Auto Gage Co., Pittsfield, Mass.
Boston Machine Works Co., Lynn, Mass.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Defender Instrument & Regulator Co., St. Louis, Mo.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Johnston & Jennings Co., Cleveland, O.
King Engineering Corp., Ann Arbor, Mich.
Krueger Sentry Gauge Co., Green Bay, Wis.
Liquidepth Indicators, Inc., Long Island City, N. Y.
Liquidometer Corp., Long Island City, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Oil Equipment Mfg. Corp., New Haven, Conn.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scully Signal Co., Melrose, Mass.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Viking Pump Co., Cedar Falls, Ia.

GAGES, PIPE

A.C.M.I. Borescope Div., American Cystoscope Makers, Inc., New York, N. Y. (internal borescope)

Dayton Rogers Mfg. Co., Minneapolis, Minn.
Defender Instrument & Regulator Co., St. Louis, Mo.
Greenfield Tap & Die Corp., Greenfield, Mass. (Thread)
Treadwell Tap & Die Co., Greenfield, Mass.
Three Point Industries, Chicago, Ill.

GALVANIZED SHEETS

See Sheets, Steel, Galvanized

GALVANNEALED SHEETS

See Sheets, Steel, Galvannealed

GARAGE VENTILATION FITTINGS

See Fittings, Exhaust, Garage, for Attaching Car Exhaust Pipe

GAS BURNERS

See Burners, Gas

GAS ENGINES

See Engines, Gas

GAS FIRED RADIATORS

See Radiators, Gas Fired

GAS PRESSURE REGULATORS

See Regulators, Pressure, Gas

GAS VENT AND FLUE PIPE

See Pipe and Fittings, Gas Vent and Flue

GAS VOLUME METERS

See Meters, Volume, Air and Gas

GASKETS

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Akron Metallic Gasket Co., Akron, O.
Alpha Metals, Inc., Jersey City, N. J.
American Felt Co., Glenville, Conn.
Anchor Packing Co., Philadelphia, Pa. (Asbestos)
Armstrong Cork Co., Lancaster, Pa. (Cork & cork composition)
Baldwin Belting, Inc., New York, N. Y.
Belmont Packing & Rubber Co., Philadelphia, Pa.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y. (Lead)
Brady Co., W. H., Milwaukee, Wis.
Carey Mfg. Co., Philip, Cincinnati, O.
Chase Brass & Copper Co., Waterbury, Conn. (Brass and copper)
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Chicago-Wilcox Mfg. Co., Chicago, Ill.
Clow & Sons, James B., Chicago, Ill.
Continental-Diamond Fibre, Newark, Del.
Continental Rubber Wks., Erie, Pa.
Crane Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y. (Asbestos)
Durabla Mfg. Co., New York, N. Y. (Asbestos fibre)
Ehret Magnesia Mfg. Co., Valley Forge, Pa
Ernst Water Column & Gauge Co., Livingston, N. J.
Excelsior Leather Washer Mfg. Co., Rockford, Ill.
Federated Metal Div., American Smelting & Refining Co., New York, N. Y.
Felt Products Mfg. Co., Chicago, Ill. (Heat and oil resisting)
Felters Company, The, Boston, Mass.
Flexitallic Gasket Co., Camden, N. J. (Metal, asbestos)
Flexlock Corp., Kent, O.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gatke Corp., Chicago, Ill.
General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass.
Goodall Rubber Co., Trenton N. J.
Goodrich Co. B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Grant Wilson Inc., Chicago, Ill (asbestos)
Graton & Knight Co., Worcester, Mass (Leather)
Greene, Tweed & Co., North Wales, Pa.
Hewitt-Robins, Inc., Stamford, Conn.
Houghton & Co., E. F., Philadelphia, Pa. (Leather)
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Linear Incorporated, Philadelphia, Pa.
Metallo Gasket Co., New Brunswick, N. J. (Metal, metal asbestos)
McCord Corp., Detroit, Mich.
Mortell Co., J. W., Kankakee, Ill.
National Engineering Products, Inc., Washington, D. C. (Plastic)
National Lead Co., New York, N. Y. (lead)
Neff-Perkins Mfg. Co., Cleveland, O.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Parker Appliance Co., The, Cleveland, O.
Products Research Co., Los Angeles, Calif.
Quaker Rubber Corp., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber and asbestos)
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Sall Mountain Co., Hamilton, O. (asbestos)
Saran Lined Pipe Co., Ferndale, Mich.
Schieren Co., Chas. A., New York, N. Y.
Sponge Products Div., B. F. Goodrich Co., Shelton, Conn.
Spring Packing Corp., Chicago, Ill. (adhesive-backed sponge rubber)
Stalwart Rubber Co., The, Bedford, O. (rubber)
Stokes Molded Products, Trenton, N. J. (Hard rubber)
Strahman Valves, Inc., New York, N. Y.
Technical Ply-Wood Sales, Chicago, Ill.
Thermoid Co., Trenton, N. J.
Tube Turns Plastics, Inc., Louisville, Ky. (for PVC pipe)
Union Asbestos & Rubber Co., Chicago, Ill.
United States Gasket Co., Camden, N. J.
United States Rubber Co., New York, N. Y. (Rubber, asbestos)
United States Stoneware Co., New York, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O. (plastic)
Vickers, Inc., Div. of Sperry Corp., El Segundo, Calif.
Western Felt Wks., Chicago, Ill. (Felt)
Wolfe Co., Inc., The, Franklin C., 3644 Eastham Drive., Culver City, Calif.
Zimmerman Packing Co., Cincinnati, O. (also gasket cutters)

GASOLINE FIRED HEATERS

See Heaters, Gasoline Fired

GAS VENT AND FLUE PIPE AND FITTINGS

See Pipe and Fittings, Gas Vent and Flue

GATES, BLAST

Allington & Curtis Mfg. Co., Saginaw, Mich.
Berger Bros., Co., Philadelphia, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Goethel Sheet Metal Works, Inc., Alfred, Milwaukee, Wis.
Kirk & Blum Mfg. Co., Cincinnati, O.
Newcomb-Detroit Co., Detroit, Mich.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Rockwell Co., W. S., Fairfield, Conn.
Spencer Turbine Co., Hartford, Conn.
Western Blower Co., Seattle, Wash.
Winkler & Sons, Inc., A. E., Milwaukee, Wis.

GATES, LIFT, FOR TRUCKS

Anthony Company, Streator, Ill.

GEAR-MOTORS

Abart Gear & Machine Co., Chicago, Ill.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Allis Co., Louis, The, Milwaukee, Wis.
Electro-Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Falk Corp., Milwaukee, Wis.
Janette Elect. Mfg. Co., Morton Grove, Ill.
Lamb Electric Co., Kent, O.
Lima Electric Motor Co., The, Lima, O.
Limitorque Corp., Philadelphia, Pa.
Link-Belt Co., Chicago, Ill.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
U. S. Electrical Motors, Inc., Los Angeles, Calif.

GENERATORS, STEAM, ELECTRIC (Electrically "Fired" Boilers)

Berry-Hill Corp., Hill Diesel Engine Div., Providence, R. I. (diesel)
Bigelow Co., The, New Haven, Conn.
Custom Engrg. Co., Los Angeles, Calif.
Hill Diesel Engine Corp., Lansing, Mich.
Orr & Sembower, Inc., Reading, Pa. (electric fired boilers)

GLASS, HEAT ABSORBING

See Windows, Heat Insulating

GLASS PIPE

See Pipe, Glass

GLASSES, GAGE

Associated Valve & Engineering Co., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Chesterton Co., A. W., Everett, Mass.
Corning Glass Works, Corning, N. Y.
Defender Instrument & Regulator Co., St. Louis, Mo.
Detroit Brass & Malleable Co., Detroit, Mich.
Diamond Power Specialty Corp., Lancaster, O.
Ernst Water Column & Gauge Co., Livingston, N. J.
Henry Valve Co., Melrose Park, Ill.
Libbey-Owens-Ford Glass Co., Toledo, O.
New York Air Valve Corp., Brooklyn, N. Y.
O P W Corp., Cincinnati, O.
Penberty Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Scientific Instrument Co., Detroit, Mich.
Security Valves Corp., Glendale, Calif.
Shank Co., Cyrus, Chicago, Ill.
Strahman Valves, Inc., New York, N. Y.
Swift Lubricator Co., The, Elmira, N. Y.
Vilter Mfg. Co., The, Milwaukee, Wis.

GLASSES, SIGHT, FOR PIPE LINES

Allin Mfg. Co., Chicago, Ill.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Chesterton Co., A. W., Everett, Mass.
Cochrane Corp., Philadelphia, Pa.
Corning Glass Works, Corning, N. Y.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fischer & Porter Co., Hatboro, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Libbey-Owens-Ford Glass Co., Toledo, O.
Mueller Brass Co., Port Huron, Mich.
Norwood Associated Engineers, Inc., Springfield, Mass.
O P W Corp., Cincinnati, O.
Penberty Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Remco, Inc., Zelienople, Pa. (for refrigerant lines)
Sarco Co., Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Swift Lubricator Co., The, Elmira, N. Y.
Webster & Co., Warren, Camden, N. J.

GLOBE VALVES

See Valves, Globe

GLYCOL VAPORIZERS

See Units, Sterilizing, Air

GOVERNORS, PUMP

Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Burrows Mfg. Co., F. A., York, Pa.
Cash Co., A. W., Decatur, Ill.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hagan Corp., Pittsburgh, Pa.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Regulator Co., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Synchro-Start Products, Inc., Skokie, Ill.
Swartwout Co., The, Cleveland, O.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Willams Gauge Co., Inc., The, Pittsburgh, Pa.

GRILLES

See also Diffusers; Panels, Perforated, for Air Diffusion; Registers

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Air-Path Products Co., Baltimore, Md. (stamped steel)
Alton Mfg. Co., Dallas, Tex.
American Warming & Ventilating Co., Toledo, O.
Auer Register Co., Cleveland, O.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Beckley Perforating Co., Garwood, N. J.
Central Wire & Iron Works, Des Moines, Ia.
Char-Gale Mfg. Co., Minneapolis, Minn.
Controlair Mfg. Co., Los Angeles, Calif.
Diamond Mfg. Co., Wyoming, Pa.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Erdle Perforating Co., Rochester, N. Y.
General Register Corp., Cedar Grove, N. J.
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Hendrick Mfg. Co., Carbondale, Pa.
Independent Register Co., Cleveland, O.
Jamieson Mfg. Co., Dallas, Tex.
Johnston & Chapman Co., Chicago, Ill.
Lima Register Co., The, Lima, O.
Louvra Mfg. & Sales Co., Union, N. J.
Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
Martin Metal Products Corp., Ferndale, Mich.
Midco Register Corp., St. Paul, Minn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mundt & Sons, Charles, Jersey City, N. J.
Palmer Mfg. Corp., Phoenix, Ariz.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Reliable Perforating Co., Chicago, Ill.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Standard Stamping & Perforating Co., Chicago, Ill.
Stewart Mfg. Co., Inc., Cedar Grove, N. J.
Titus Mfg. Corp., Waterloo, Iowa.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Viking Mfg. Corp., Cleveland, O.
Waterloo Register Co., Inc., Waterloo, Ia.
Western Wire & Iron Works, Inc., Chicago, Ill. (metal)
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Young Regulator Co., Cleveland, O.

GRINDERS AND GRINDING WHEELS, WELD

Anderson & Co., Inc., Sioux City, Ind.
Baldor Electric Co., St. Louis, Mo.
Black & Decker Mfg. Co., The, Towson, Md.
Buckeye Tools Corp., Dayton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Cincinnati Electrical Tool Co., The, Cincinnati, O.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Franklin Balmar Corp., Baltimore, Md.
Mall Tool Co., Chicago, Ill.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Norton Co., Worcester, Mass.
Raybestos-Manhattan, Inc., Passaic, N. J.
Rotor Tool Co., Cleveland, O.
Skil Corp., Chicago, Ill.
Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago, Ill.
Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Stanley Works, The, New Britain, Conn.
Thor Power Tool Co., Aurora, Ill.

GUNS, POTS AND CANDLES, SMOKE AND SMUDGE, FOR TESTING AIR MOVEMENT

Hill & Co., Vernon E., Lake Geneva, Wis.
Kilgore, Inc., Westerville, O.
Mine Safety Appliances Co., Pittsburgh, Pa.
Unexcelled Chemical Corp., New York, N. Y.

HAND SHEARS

See Shears and Snips, Hand

HANGERS OR BRACKETS, RADIATOR

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Arjac Products, Inc., Rochester, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Carty & Moore Engineering Co., Detroit, Mich.
Crawford Co., Chicago, Ill.
Fee & Mason Mfg. Co., Manasquan, N. J.
Gateway Engineering Co., Chicago, Ill.
Hartmann Co., Chas., Brooklyn, N. Y.
Healy Ruff Co., St. Paul, Minn.
Jennison Co., The, Fitchburg, Mass. (Adjustable radiator foot rest)
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Radiant-Ray Radiation, Inc., Newington, Conn.
Rittling Corp., The, Buffalo, N. Y.
Unistrut Products Co., Chicago, Ill.

HANGERS AND SUPPORTS, DUCT

Acme Mfg. Co., Philadelphia, Pa.
Adelta Mfg. Co., Inc., Philadelphia, Pa. (galvanized)
Corbman Bros., Inc., Philadelphia, Pa.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J. (vibration)
Hexdall Co., A. M., Morris, Ill.
Inland Steel Products Co., Milwaukee, Wis. (galvanized)
Moore Inc., Goodloe E., Danville, Ill.
Phillips Drill Co., Michigan City, Ind. (self-drilling expansion shells)
Powder Power Tool Corp., Portland, Ore.
Steel City Electric Co., Pittsburgh, Pa. (trapeze)
Unistrut Products Co., Chicago, Ill.
Velocity Power Tool Co., Div. of Mine Safety appliance Co., Pittsburgh, Pa. (cartridge stud driver)
Waverly Heating Supply Co., Boston, Mass.

HANGERS AND SUPPORTS, PIPE

Air-Path Products Co., Baltimore, Md. (inserts)
American District Steam Div. of ADSCO Industries, Buffalo, N. Y. (cast)
American Tube Products, Inc., Natick, R. I. (copper tube)
Armart Mfg. Co., Pittsfield, Mass. (copper tube hangers & straps, wire pipe hooks, galv. pipe straps, and perforated hanger iron)
Basic Engineers, Pittsburgh, Pa.
Bergen Pipesupport Corp., New York, N. Y. (variable spring constant support)
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa. (spring and solid)
Carpenter & Paterson, Inc., Cambridge, Mass.
Chase Brass & Copper Co., Waterbury, Conn. (copper strap)
Commercial Plastics Co., Chicago, Ill. (plastic strap)
Crane Co., Chicago, Ill.
Crawford Co., Chicago, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Finn & Co., Inc., T.R., Hawthorne, N. J. (Rubber-in-shear & steel spring)
Frick Co., Waynesboro, Pa.
G & H Mfg. Co., Philadelphia, Pa. (hook)

Gateway Engineering Co., Chicago, Ill.
General Fittings Co., East Greenwich, R. I. (strap hangers)
Gerrard & Co., A. J., Melrose Park, Ill. (strap)
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Hupp Corp., Globe Stamping Div., Cleveland, O.
Korfund Co., Inc., Long Island City, N. Y.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y. (spring hangers and roller hangers)
Minerallac Electric Co., Chicago, Ill.
Modern Hanger Co., Cleveland, O.
Moore Inc., Goodloe E., Danville, Ill.
National-U. S. Radiator Corp., Johnstown, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa. (counterpoise)
Northern Indiana Brass Co., Elkhart, Ind. (copper tube)
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind. (self-drilling expansion shells)
Piping Specialties, Inc., New York, N. Y. (anchor and guide for expansion joints)
Powder Power Tool Corp., Portland, Ore.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., Cleveland, O. (conduit clips)
Ravena Iron Co., Ravena, N. Y. (hook plates)
Ritter Pattern & Casting Co., New York, N. Y. (jack type adjustable tunnel stanchion)
Rockwood Sprinkler Co., Worcester, Mass.
Roessing Mfg. Co., Pittsburgh, Pa.
Schaub Engineering Co., Fred H., Chicago, Ill. (pipe stands)
Steel City Electric Co., Pittsburgh, Pa. (clamps, clips, rollers, hangers)
Steinen Mfg. Co., Wm., Newark, N. J.
Titchener, E. H. & Co., Binghamton, N. Y. (wire staples for copper & brass tubing)
Truscon Steel Div., Republic Steel Corp., Youngstown, O. (pressed steel inserts)
Unistrut Products Co., Chicago, Ill.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.
(cartridge stud driver)
Vibration Mounting, Inc., Elmhurst, N. Y. (vibration hangers)
Walworth Co., New York, N. Y.
Western Wire Products Co., St. Louis, Mo. (wire pipe hooks and perforated hanger iron)

HARD RUBBER PIPE AND FITTINGS

See Pipe, Hard Rubber; Fittings, Pipe, Hard Rubber

HARDWARE

See Parts for Heating and Air Conditioning Equipment

HEADERS, PIPE, WELDED

Albert Pipe Supply Co., Brooklyn, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Pipe & Steel Corp., Alhambra, Calif.
Atlantic Pipe Bending & Fabricating Corp., Wood-Ridge, N. J.
Biggs Boiler Wks. Co., The, E. Akron, O.
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa.
Buffalo Tank Corp., Dunellen, N. J.
Chicago Nipple Mfg. Co., Cicero, Ill.
Clow & Sons, James B., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Elmwood, Conn.
Columbian Steel Tank Co., Kansas City, Mo.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crane Co., Chicago, Ill.
Downingtown Iron Works, Downingtown, Pa.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Flori Pipe Co., The, St. Louis, Mo.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Whittier, Calif.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Heat & Power Corp., Baltimore, Md.
International Engineering Wks., Inc., Framingham, Mass.
Kellogg Co., M. W., The, New York, N. Y.
Lumsden & Van Stone Div. of Midwest Piping Co., Inc., South Boston, Mass.
Marquette Coppersmithing Co., Philadelphia, Pa.
Michigan Pipe Co., Gagetown, Mich.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Ohio Pipe Bending & Mach. Co., Cleveland, O.
Philadelphia Pipe Bending Co., Philadelphia.
Pittsburgh Pipe Coil & Bending Co., Etna, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Red Jacket Co., Inc., Carnegie, Pa.
Rempe Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Shaw Co., Benjamin F., Wilmington, Del.
Shaw Kendall Engineering Co., Toledo, O.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., Milwaukee, Wis.
Western Piping & Engineering Co., San Francisco, Calif.
Whitlock Mfg. Co., Hartford, Conn.

HEADS, EXHAUST, FOR PIPE LINES

Anderson Co., V. D., The, Cleveland, O.
Centrifix Corp., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Hoppes Mfg. Co., Inc., Springfield, O.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Swartwout Co., The, Cleveland, O.
U. S. Pipe & Mfg. Co., San Francisco, Calif.
Wright-Austin Co., Detroit, Mich.

HEADS, SAFETY

Black, Sivalls & Bryson, Inc., Kansas City, Mo.

HEADS, SPRINKLER, FOR FIRE PROTECTION

Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Grinnell Co., Inc., Providence, R. I.
Hodgman Mfg. Co., Inc., Taunton, Mass.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.

HEAT EXCHANGERS

See Chillers, Water; Condensers, Refrigerating; Exchangers, Heat; Surface, Finned, Cooling; Surface, Finned, Heating

HEAT PUMPS

See Units, Air Conditioning, Reverse Refrigeration Cycle

HEAT RECOVERY UNITS

See Units, Heat Recovery

HEAT REGENERATORS

See Units, Heat Recovery

HEATERS, AIR, DIRECT FIRED, COAL

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Rosebraugh Co., W. W., Salem, Ore.

HEATERS, AIR, DIRECT FIRED, COMBINATION GAS AND OIL

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
Auto-Therm Mfg. Co., Detroit, Mich.
Besser Metal Products Corp., Charlotte, N. C.
Chicago Steel Furnace Co., Chicago, Ill.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Inland Heater Corp., Minneapolis, Minn.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corp., Wilmington, Del.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., St. Paul, Minn.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Prat-Daniel Corp., South Norwalk, Conn.
Rockwell Co., W. S., Fairfield, Conn.
Ross Engineering Corp., J. O., New York, N. Y.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.

HEATERS, AIR, DIRECT FIRED, GAS, CENTRIFUGAL FAN TYPE

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
Auburn Burner Co., Auburn, Ind.
Automatic Gas Equipment Co., Pittsburgh, Pa.
Auto-Therm Mfg. Co., Detroit, Mich.
Besser Metal Products Corp., Charlotte, N. C.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Dravo Corp., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
General Gas Light Co., Kalamazoo, Mich.
Hastings Air Control, Inc., Omaha, Nebr.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Inland Heater Corp., Minneapolis, Minn.
International Sales Co., San Francisco, Calif.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mueller Climatrol, Milwaukee, Wis.
Nat Corp., Kansas City, Mo.
National Heater Co., St. Paul, Minn.
Newcomb-Detroit Co., Detroit, Mich.
Norge Heat Div., Borg-Warner Corp., Detroit, Mich.
Norman Products Co., Inc., Columbus, O.
Olson & Co., Arthur A., Canfield, O.
OverHead Heaters, Inc., Detroit, Mich.
Payne Div. of Carrier Corp., Monrovia, Calif.
Peerless Mfg. Corp., Louisville, Ky.
Prat-Daniel Corp., South Norwalk, Conn.
Reznor Mfg. Co., Mercer, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Sterlairco, Inc., Westfield, Mass.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Surface Combustion Corp., Toledo, O.
Tjernlund Mfg. Co., St. Paul, Minn.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Vapor Heating Corp., Chicago, Ill.
Young Radiator Co., Racine, Wis.
Zink Co., John, Tulsa, Okla.

HEATERS, AIR, DIRECT FIRED, OIL, FLOOR TYPE

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air. See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Foundry & Furnace Co., Bloomington, Ill.
Armstrong Furnace Co., Columbus, O.
Auto-Therm Mfg. Co., Detroit, Mich.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Gilbert & Barker Mfg. Co., West Springfield, Mass.

Inland Heater Corp., Minneapolis, Minn.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corp., Wilmington, Del.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., St. Paul, Minn.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Prat-Daniel Corp., South Norwalk, Conn.
Ross Engineering Corp., J. O., New York.
Tjernlund Mfg. Co., St. Paul, Minn.
Vapor Heating Corp., Chicago, Ill.
Williams Div., Eureka Williams Co., Div. of Henney Motor Co., Inc., Bloomington, Ill.

HEATERS, AIR, DIRECT FIRED, OIL, PORTABLE, FOR INDUSTRIAL SPACE HEATING

Air Conditioning Engineering Co., Cambridge, Mass.
American Foundry & Furnace Co., Bloomington, Ill. (400,000-2,000,000 Btu per hr)
Armstrong Furnace Co., Columbus O. (350,000-450,000 Btu per hr)
Auburn Burner Co., Auburn, Ind.
Auto-Therm Mfg. Co., Detroit, Mich.
Bica Co., Girard, O. (50,000-85,000 Btu)
Campbell Heating Co., Des Moines, Ia. (Up to 3,150,000 Btu)
Cauhorn Distributing Co., Detroit, Mich. (190,000 Btu)
Certified Furnace Corp., Trenton, N. J. (112—280,000 Btu per hr output)
Chicago Steel Furnace Co., Chicago, Ill.
Clayton Mfg. Co., El Monte, Calif.
Delta Heating Corp., Trenton, N. J.
Fageol Co., R. D., Heat Machine Div., Kent, O. (168,000 and 189,000 Btu)
Interstate Heater Mfg. Co., Denver, Colo. (80,000-180,000 Btu per hr)
Jackson & Church Co., Saginaw, Mich. (400,000 Btu — 2,000,000 Btu per hr output at Bonnet)
Johnson Heater Corp., Chelsea, Mass. (500,000 Btu)
Lennox Industries, Inc., Marshalltown, Ia. (245,000 Btu per hr)
Master Vibrator Co., Dayton, O.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Prat-Daniel Corp., South Norwalk, Conn. (100,000 Btu up to 2,225,000 Btu)
Quiet Automatic Oil Burner Corp., Newark, N. J.
Tjernlund Mfg. Co., St. Paul, Minn.

HEATERS, AIR, DIRECT FIRED, OIL, SUSPENDED TYPE

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Furnace Co., St. Louis, Mo.
Auburn Burner Co., Auburn, Ind.
Auto-Therm Mfg. Co., Detroit, Mich.
Besser Metal Products Corp., Charlotte, N. C.
Campbell Co., E. K., Kansas City, Mo.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Cox Mfg. Co., Ridgeville, Ind.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Fluid Heat Div., Anchor Post Products, Inc., Baltimore, Md.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Harvey-Whipple, Inc., Springfield, Mass.
Ingersoll Conditioned Air Div., Borg-Warner Corp., Kalamazoo, Mich.
Inland Heater Corp., Minneapolis, Minn.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corp., Wilmington, Del.
Mueller Climatrol, Milwaukee, Wis.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Olson Mfg. Co., C. A., Elyria, O.
OverHead Heaters, Inc., Detroit, Mich.
Prat-Daniel Corp., South Norwalk, Conn.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Syncromatic Corp., Watertown, Wis.
Thermo-Products, Inc., North Judson, Ind.
Tjernlund Mfg. Co., St. Paul, Minn.

Viking Mfg. Corp., Cleveland, O.
Waterman-Waterbury Co., The, Minneapolis, Minn.
Weatherall Engineers, Inc., Providence, R. I.
Williams Div., Eureka Williams Co., Div. of Henney Motor Co., Inc., Bloomington, Ill.

HEATERS, CONVECTION

See Radiation, Convection Type

HEATERS, DUCT, ELECTRIC

Brown Fintube Co., The, Elyria, O.
Consolidated Metal Products Corp., Albany, N. Y.
Despatch Oven Co., Minneapolis, Minn.
Electromode Corp., Rochester, N. Y.
Electro-Therm, Inc., Silver Spring, Md.
Falcon Equipment Co., New Brighton, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
Hynes Electric Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Tenney Engineering, Inc., Newark, N. J.
Trent, Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wing Mfg. Co., L. J., Linden, N. J.

HEATERS, DUCT, GAS

Allan Engineering Co., Dallas, Tex.
Automatic Gas Equipment Co., Pittsburgh, Pa.
Auto-Therm Mfg. Co., Detroit, Mich.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Campbell Heating Co., Des Moines, Ia.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
General Gas Light Co., Kalamazoo, Mich.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Inland Heater Corp., Minneapolis, Minn.
International Sales Co., San Francisco, Calif.
Jackson & Church Co., Saginaw, Mich.
Kehm Corp., The, Chicago, Ill.
Lennox Industries, Inc., Marshalltown, Ia.
Maxon Premix Burner Co., Muncie, Ind.
Meyer Furnace Co., The, Peoria, Ill.
Modine Mfg. Co., Racine, Wis.
National Heater Co., Inc., St. Paul, Minn.
Norman Products Co., Inc., Columbus, O.
Payne Div. of Carrier Corp., Monrovia, Calif.
Peerless Mfg. Corp., Louisville, Ky.
Reznor Mfg. Co., Mercer, Pa.
Royal Jet, Inc., Alhambra, Calif.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Sterlairco, Inc., Westfield, Mass.
Sterling Heat Specialties Inc., Westfield, Mass.
Surface Combustion Corp., Toledo, O.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Viking Mfg. Corp., Cleveland, O.
Wing Mfg. Co., L. J., Linden, N. J.

HEATERS, DUCT, OIL FIRED

Auto-Therm Mfg. Co., Detroit, Mich.
Campbell Heating Co., Des Moines, Ia.
Certified Furnace Corp., Trenton, N. J.
Chicago Steel Furnace Co., Chicago, Ill.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Inland Heater Corp., Minneapolis, Minn.
Interstate Heater Mfg. Co., Denver, Colo.
Jackson & Church Co., Saginaw, Mich.
OverHead Heaters, Inc., Detroit, Mich.
Republic Products Co., Philadelphia, Pa.
Viking Mfg. Corp., Cleveland, O.

HEATERS, ELECTRIC, OIL-HEATING, FOR PREVENTING FOAMING IN CRANKCASE COMPRESSOR OIL

Electro-Therm, Inc., Silver Spring, Md.
Heatube Corp., Allegan, Mich.
Vulcan Electric Co., Danvers, Mass.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, FEEDWATER

See Deaerators

HEATERS, GASOLINE FIRED (FOR AIRCRAFT AND PORTABLE GROUND USE)

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
Coleman Co., Inc., The, Wichita, Ks.
Fluid Heat Div., Anchor Post Products Inc., Baltimore, Md.
Insto-Gas Corp., Detroit, Mich.
National Heater Co., St. Paul, Minn.
Perfection Industries Div., Hupp Corp., Cleveland, O.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Surface Combustion Corp., Toledo, O.

HEATERS, INDIRECT, SUBMERGED

American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., Elyria, O.
Davis Engineering Corp., Elizabeth, N. J.
General Ceramics Corp., Keasbey, N. J. (quartz & graphite)
General Fittings Co., East Greenwich, R. I.
General Heater & Regulators Co., East Chicago, Ind.
Gerstein & Cooper Co., Inc., South Boston, Mass.
Graham Mfg. Co., Inc., New York, N. Y.
Heatube Corp., Allegan, Mich.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Richmond Engineering Co., Richmond, Va.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters, Inc., Bronx, N. Y.

HEATERS, OIL

See Preheaters, Fuel Oil; Units, Fuel Oil, Heating, Pumping and Straining

HEATERS, RADIATION, FOR SUPPLYING HOT WATER RADIATION FROM STEAM BOILER

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
Alstrom Corp., New York, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Davis Engineering Corp., Elizabeth, N. J.
Lindy Heaters, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Union Asbestos & Rubber Co., Chicago, Ill.
Viking Mfg. Corp., Cleveland, O.
Yula Water Heaters, Inc., Bronx, N. Y.

HEATERS, STEAM JET, FOR LIQUIDS

Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Duriron Co., Inc., The, Dayton, O.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Heil Process Equipment Corp., Cleveland, O.
O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
National Carbon Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Sims Pump Valve Co., Hoboken, N. J.

HEATERS, STRIP AND IMMERSION, ELECTRIC

American Instrument Co., Inc., Silver Spring, Md.
Consolidated Metal Products Corp., Albany, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Electro-Therm, Inc., Silver Spring, Md.
Falcon Equipment Co., New Brighton, Pa.
Ferro Electric Products, Inc., Kirkland, Ill. (electric heating elements for room air

conditioners)
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
Heil Process Equipment Corp., Cleveland, O.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Red Spot Electric Co., Tacoma, Wash.
S&C Mfg. Co., Cincinnati, O.
Syntron Co., Homer City, Pa.
Titan Mfg. Co., Buffalo, N. Y.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, SUSPENDED, RADIANT, ELECTRIC

Berko Electric Mfg. Co., Queens Village, N. Y.
Crystalheat Co., Van Nuys, Calif.
Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Electriglas Corp., Bergenfield, N. J.
Electromode Corp., Rochester, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
S&C Mfg. Co., Cincinnati, O.
ThermoRay Corp., Irvington-On-Hudson, N. Y.
Trent, Inc., Philadelphia, Pa.
Union Chill Mat Co., Pittsburgh, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, SUSPENDED, RADIANT, GAS FIRED

Coleman Co., Inc., The, Wichita, Kans.
Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
Nat Corp., Kansas City, Mo.
Olson & Co., Arthur A., Canfield, O.
Union Chill Mat Co., Pittsburgh, Pa.

HEATERS, UNIT, ELECTRIC HEATING ELEMENT

Circle-Air Industries, Inc., Brooklyn, N. Y.
Crystalheat Co., Van Nuys, Calif.
Electriglas Corp., Bergenfield, N. J.
Electromode Corp., Rochester, N. Y.
Electro-Therm, Inc., Silver Spring, Md.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Lintern Corp., Painesville, O.
Marvinay, Inc., Newark, N. J.
Norris-Thermador Corp., Los Angeles, Calif.
Palmer Mfg. Corp., Phoenix, Airz.
Red Spot Electric Co., Tacoma, Wash.
Royal Heaters, Inc., Alhambra, Calif.
Thermador Electrical Mfg., Los Angeles.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wing Mfg. Co., L. J., Linden, N. J.

HEATERS, UNIT, ELECTRIC HEATING ELEMENT, EXPLOSION PROOF

Electromode Corp., Rochester, N. Y.
Electro-Therm, Inc., Silver Spring, Md.
Heatube Corp., Allegan, Mich.
Trent, Inc., Philadelphia, Pa.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, UNIT, GAS, PROPELLER FAN TYPE

Airtherm Mfg. Co., St. Louis, Mo.
Allan Engineering Co., Dallas, Tex.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Furnace Co., St. Louis, Mo.
Automatic Gas Equipment Co., Pittsburgh, Pa.
Barwick Mfg. Corp., Wichita, Kan.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Carrier Corp., Syracuse, N. Y.
Clow & Sons, James B., Chicago, Ill.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Fedders-Quigan Corp., Buffalo, N. Y.
General Gas Light Co., Kalamazoo, Mich.
Grinnell Co., Inc., Providence, R. I.
Hastings Air Control, Inc., Omaha, Nebr.
Henry Furnace Co., The, Medina, O.
International Sales Co., San Francisco, Calif.
Ilg Electric Ventilating Co., Chicago, Ill.
Jackson & Church Co., Saginaw, Mich.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Mission Appliance Corp., Hawthorne, Calif.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Milwaukee, Wis.
Nat Corp., Kansas City, Mo.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Norman Products Co., Inc., Columbus, O.
Ohio Foundry & Mfg. Co., Steubenville, O.
Olsen Mfg. Co., C. A., Elyria, O.
Payne Div. of Carrier Corp., Monrovia, Calif.
Peerless Mfg. Corp., Louisville, Ky.
Reznor Mfg. Co., Mercer, Pa.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Sonner Burner Co., Winfield, Kan.
Sterling Heat Specialties, Inc., Westfield, Mass.
Surface Combustion Corp., Toledo, O.
Temco, Inc., Nashville, Tenn.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Vacuum Gas Burner, Olean, N. Y.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Hyde Park, Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.
Worthington Corp., Harrison, N. J.
Young Radiator Co., Racine, Wis.
Zink Co., John, Tulsa, Okla.

HEATERS, UNIT, OIL, PROPELLER FAN TYPE

Delta Heating Corp., Trenton, N. J.
Interstate Heater Mfg. Co., Denver, Colo.
Sterlairco, Inc., Westfield, Mass.

HEATERS, UNIT, STEAM AND HOT WATER, CABINET TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Thermal Industries, Inc., Detroit, Mich.
Brown Products Co., Forest Hills, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Dunham Co., C. A., Chicago, Ill.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Hastings Air Control, Inc., Omaha, Nebr.
McCord Corp., Detroit, Mich.
Modine Mfg. Co., Racine, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
Trane Co., The, La Crosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Young Radiator Corp., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, CENTRIFUGAL FAN TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Thermal Industries, Inc., Detroit.
Bishop & Babcock Mfg. Co., Cleveland, O.
Blazer, M. & Son, Passiac, N. J.
Brown Products Co., Forest Hills, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Dunham Co., C. A., Chicago, Ill.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Hastings Air Control, Inc., Omaha, Nebr.
Kennard Corp., St. Louis, Mo.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
Young Radiator Co., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, HORIZONTAL BLOW

Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Beacon-Morris Corp., Boston, Mass.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Buffalo, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Grinnell Co., Inc., Providence, R. I.
Hartzell Propeller Fan Co., Piqua, O.
Ilg Electric Ventilating Co., Chicago, Ill.
King Co. of Owatonna, The, Owatonna, Minn.
Kisco Boiler & Engineering Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Merchant & Evans Co., Philadelphia, Pa.
Modine Mfg. Co., Racine, Wis.
Muckle Mfg. Co., Owatonna, Minn.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wilson Engineering Corp., Chicago, Ill.
Wing Mfg. Co., L. J., Linden, N. J.
Young Radiator Co., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, VERTICAL BLOW

Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Beacon-Morris Corp., Boston, Mass.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Buffalo, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Gallaher Co., The Omaha, Neb.

Grinnell Co., Inc., Providence, R. I.
Johnson Corp., Three Rivers, Mich.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Silco Products Inc., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J. (Revolving)
Young Radiator Co., Racine, Wis.

HEATERS, VENTILATION

See Surface, Pinned, Heating; Ventilators, Roof, Pan; Ventilators, Unit; Surface, Finned, Heating; Ventilators, Roof, Pan

HEATERS, WALL CIRCULATING, GAS FIRED

Coleman Co., Inc., The, Wichita, Ks
Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
General Gas Light Co., Kalamazoo, Mich.
Kresky Mfg. Co., Petaluma, Calif.
Lennox Industries, Inc., Marshalltown, Ia
Mission Appliance Corp., Hawthorne, Calif.
Ohio Foundry & Mfg. Co., Steubenville, O.
Payne Div. of Carrier Corp., Monrovia, Calif
Peerless Mfg. Corp., Pittsburgh, Pa.
Rheem Mfg. Co., Chicago, Ill.
Royal Jet, Inc., Alhambra, Calif.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Temco, Inc., Nashville, Tenn.
Westinghouse Electric Corp., Sturtevant Div., Hyde Park, Boston, Mass.
Zink Co., John, Tulsa, Okla.

HEATERS, WALL CIRCULATING, OIL FIRED

Delta Heating Corp., Trenton, N. J.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Kleer Kleen Mfg. Co., Hayward, Calif.
Kresby Mfg. Co., Petaluma, Calif.
Monogram Products Co., Inc., Philadelphia, Pa.

HEATERS, WATER, AIR-TANKLESS

Tankless Water Heater and Compression Tank Combined

American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
General Fittings Co., East Greenwich, R. I.
Taco Heaters, Inc., Cranston, R. I.

HEATERS, WATER, CAST IRON, COAL FIRED

Adams Co., The, Dubuque, Ia.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Burnham Corp., Irvington, N. Y.
National-U. S. Radiator Corp., Johnstown, Pa
Peerless Heater Co., The, Div. of The Eastern Foundry Co., Boyertown, Pa.
Prox Co., Inc., Frank, Terre Haute, Ind.
Smith Co., Inc., H. B., The, Westfield, Mass
Weil-McLain Co., Michigan City, Ind.

HEATERS, WATER, ELECTRIC

Allcraft Mfg. Co., Cambridge, Mass.
Auburn Burner Co., Auburn, Ind.
Bastian-Morley Co., Inc., LaPorte, Ind.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Cleveland Heater Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Crane Co., Chicago, Ill.
Custom Engineering Co., Los Angeles, Calif.
Cutler-Hammer, Inc., Milwaukee, Wis.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Electro-Therm, Inc., Silver Spring, Md.
Frigidaire Div., General Motors Corp., Dayton, O.
Hanson-Gates Mfg. Co., Inc., Reading, Mass
Heatube Corp., Allegan, Mich.
Heat-X Inc., Brewster, N. Y.
Hotpoint Co., Chicago, Ill.
Hotstream Heater Co., Cleveland, O.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
McGraw Electric Co., Clark Div., Chicago, Ill.
Mission Appliance Corp., Hawthorne, Calif.
National Steel Construction Co., Logansport, Ind.
National-U. S. Radiator Corp., Johnstown, Pa.
Norris-Thermador Corp., Los Angeles, Calif.
Red Spot Electric Co., Tacoma, Wash.
Rheem Mfg. Co., Chicago, Ill.
Smith Corp., A. O., Milwaukee, Wis.
Thermador Electrical Mfg., Los Angeles, Calif.
Trent Inc., Philadelphia, Pa.
Viking Mfg. Corp., Cleveland, O.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wood Co., John, Conshohocken, Pa.
York-Shipley, Inc., York, Pa.

HEATERS, WATER, GAS FIRED

Ajax Boiler & Heater Co., Gardena, Calif.
Aldrich Co., Wyoming, Ill.
Alstrom Corp., New York, N. Y.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Auburn Burner Co., Auburn, Ind.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bica Co., Girard, O.
Bock Corp., Madison, Wis.
Brown Products Co., Forest Hills, N. Y.
Bryan Steam Corp., Peru, Ind.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Cleaver-Brooks Co., Milwaukee, Wis.
Cleveland Heater Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Crane Co., Chicago, Ill.
Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Hanson-Gates Mfg. Co., Inc., Reading, Mass.
Hotstream Heater Co., Cleveland, O.
Hydrotherm, Inc., Northvale, N. J.
Kehm Corp., The, Chicago, Ill.
McGraw Electric Co., Chicago, Ill.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
Mission Appliance Corp., Hawthorne, Calif.
Montgomery Bros., San Francisco, Calif.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
Mueller Climatrol, Milwaukee, Wis.
Mund Boilers, Inc., Los Angeles, Calif.
National Steel Construction Co., Logansport, Ind.
National-U. S. Radiator Corp., Johnstown, Pa
Norse Boiler Co., Inc., New Market, N. J.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Parker, Sid F., Los Angeles, Calif.
Pioneer Water Heater Corp., Los Angeles, Calif.
Radiant Heat and Cooling Co., Santa Clara, Calif.
Raypak Co., Inc., Los Angeles, Calif.
Rheem Mfg. Co., Chicago, Ill
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
Riverside Boiler and Engineering Co., Ft. Worth, Tex.
Ruud Mfg. Co., Kalamazoo, Mich.
Schoedinger, Inc., F. O., Columbus, O.
Sellers Engineering Co., Chicago, Ill.
Smith Co., Inc., H. B., The, Westfield, Mass
Smith Corp., A. O., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Sullivan Valve & Engineering Co., Butte, Mont.
Viking Mfg. Corp., Cleveland, O.
Wood Co., John, Conshohocken, Pa.
York-Shipley, Inc., York, Pa.

HEATERS, WATER, INDIRECT

Alberger Heater Div., ADSCO Industries Inc., Buffalo, N. Y.
Alstrom Corp., The, New York, N. Y.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Davis Engineering Corp., Elizabeth, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Ferguson & Lange Foundry Co., Chicago, Ill.
General Fittings Co., East Greenwich, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Graham Mfg. Co., Inc., New York, N. Y.
Harrison Sheet Steel Co., Chicago, Ill.
Hydrotherm, Inc., Northvale, N. J.
Kehm Corp., The, Chicago, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Lewis & Co., Joseph E., Baltimore, Md.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
Sellers Engineering Co., Chicago, Ill.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters, Inc., Bronx, N. Y.

HEATERS, WATER, INDIRECT, COMBINATION TANK AND TANKLESS

Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Alstrom Corp., The, New York, N. Y.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Burnham Corp., Boiler Div., Irvington, N. Y.
Buxton Mfg. Co., Dover, N. J.
Carpenter Heating & Stoker Co., Cleveland, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crotty Mfg. Corp., Long Island, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
General Ceramics Corp., Keasbey, N. J. (quartz & graphite)
General Fittings Co., East Greenwich, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Hydrotherm, Inc., Northvale, N. J.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Richmond Engineering Co., Richmond, Va.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Weil-McLain Co., Michigan City, Ind.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters, Inc., Bronx, N. Y.

HEATERS, WATER, OIL FIRED

Aeroil Products Co., Inc., South Hackensack, N. J.
Air Devices, Inc., New York, N. Y.
Aldrich Co., Wyoming, Ill.

Alstrom Corp., New York, N. Y.
Auburn Burner Co., Auburn, Ind.
Bock Corp., Madison, Wis.
Brown Products Co., Forest Hills, N. Y.
Bryan Steam Corp., Peru, Ind.
Burnham Corp., Irvington, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Cleaver-Brooks Co., Milwaukee, Wis.
Delta Heating Corp., Trenton, N. J.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Electrol Burner Mfg. Co., Inc., Rutherford, N. J.
Hanson-Gates Mfg. Co., Inc., Reading, Mass.
Hotstream Heater Co., Cleveland, O.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
Mueller Climatrol, Milwaukee, Wis.
Mund Boilers, Inc., Los Angeles, Calif.
National Steel Construction Co., Logansport, Ind.
National-U. S. Radiator Corp., Johnstown, Pa.
Norse Boiler Co., Inc., New Market, N. J.
Nu-Way Corp., The, Rock Island, Ill.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Parker, Sid E., Los Angeles, Calif.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Petro, 3170 W. 106th St., Cleveland, O.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Radiant Utilities Corp., Brooklyn, N. Y.
Ray Oil Burner Co., San Francisco, Calif.
Reif-Rexoil, Inc., Buffalo, N. Y.
Rheem Mfg. Co., Chicago, Ill.
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
Shephard Heater Co., Inc., Terre Haute, Ind.
Smith Co., Inc., H. B., The, Westfield, Mass.
Sullivan Valve & Engineering Co., Butte, Mont.
Vapor Heating Corp., Chicago, Ill.
Viking Mfg. Corp., Cleveland, O.

HEATERS, WATER, STEAM, INSTANTANEOUS

Aerco Corp., Northvale, N. J.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Buxton Mfg. Co. Dover, N. J.
Coe Mfg. Co., Painesville, O. (safety water heater)
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Fittings Co., East Greenwich, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Gerstein & Cooper Co., Inc., South Boston, Mass.
Graham Mfg. Co., Inc., New York, N. Y.
Hasco Valve & Machine Co., Milwaukee, Wis.
Johnson Corp., The, Three Rivers, Mich.
Kewanee-Ross Corp., Kewanee, Ill.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lewis & Co., Joseph E., Baltimore, Md.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Marion Machine Foundry & Supply Co., Marion, Ind.
Montgomery Bros., San Francisco, Calif.
National Pipe Bending Co., New Haven, Conn.
Novelty Steam Boiler Works, Inc., Baltimore, Md.
O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pick Mfg. Co., West Bend, Wis. (direct steam injection)
Radiant Utilities Corp., Brooklyn, N. Y.
Richmond Engineering Co., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Screw Machine Products Co., Portland, Ore.
Sims Co., Erie, Pa.
Swartwout Co., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Viking Mfg. Corp., Cleveland, O.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters, Inc., Bronx, N. Y.

HEATERS, WATER, STEAM, STORAGE

Aerco Corp., Northvale, N. J.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Burnham Corp., Boiler Div., Irvington, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering Inc., Somerville, Mass.
Davis Engineering Corp., Elizabeth, N. J.
General Fittings Co., East Greenwich, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Gerstein & Cooper Co., Inc., South Boston, Mass.
Hoppes Mfg. Co., Inc., Springfield, O.
Johnson Corp., The, Three Rivers, Mich.
Kewanee-Ross Corp., Kewanee, Ill.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lindy Heaters, Inc., New York, N. Y.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Manning & Lewis Engineering Co., Newark, N. J.
Marion Machine Foundry & Supply Co., Marion, Ind.
National Pipe Bending Co., New Haven, Conn.
Parker, Sid E., Los Angeles, Calif.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Quaker City Iron Works, Philadelphia, Pa.
Richmond Engineering Co., Richmond, Va.
Schaub Engineering Co., Fred H., Chicago.
Sims Co., Erie, Pa.
Stout & Sons, David, St. Louis, Mo.
Swartwout Co., The, Cleveland, O.
Taco Heaters, Inc. Cranston, R. I.
Tranter Mfg. Inc., Lansing, Mich.
Viking Mfg. Corp., Cleveland, O.
Vogt Machine Co., Henry, Louisville, Ky.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters Inc., Bronx, N. Y.

HEATERS, WATER, STEEL, COAL FIRED

Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Johnston Bros., Inc., Ferrysburg, Mich.
Kewanee-Ross Corp., Kewanee, Ill.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Terre Haute Boiler Works, Co., Terre Haute, Ind.

HEATING BOILERS

See Boilers, Heating

HEATING COILS

See Surface, Finned, Heating

HEATING SURFACE

See Surface, Finned, Heating

HOISTS, PORTABLE, FOR INSTALLING HEATING, PIPING AND AIR CONDITIONING EQUIPMENT

Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Clipper Mfg. Co., Kansas City, Mo.
Coffing Hoist Div., Duff-Norton Co., Danville, Ill.
Detroit Hoist & Machine Co., Detroit, Mich.
Harnischfeger Corp., Milwaukee, Wis.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Lug-All Co., The, Wynnewood, Pa.

HOLDERS AND FILES, CATALOG, FOR ENGINEERS' AND CONTRACTORS' OFFICES

Geneva Mfg. Co., Geneva, Ill.

HOODS, FUME DISPOSAL, LABORATORY

Atlas Mineral Products Co., Mertztown, Pa.
Corite Products, Inc., Chicago, Ill. (plastic lined)
Kewaunee Mfg. Co., Adrian, Mich.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Sheldon Equipment Co., E. H., Muskegon, Mich.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.

HOSE CLAMPS

See Clamps, Hose

HOSE, FLEXIBLE, METAL, AND FITTINGS

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
American Metal Hose Div., The American Brass Co., Waterbury, Conn.
Ammerman Co., C. L., Minneapolis, Minn.
Atlantic Metal Hose Co., Inc., New York, N. Y.
Breeze Corporations, Inc., Union, N. J.
Chiksan Co., Brea, Calif.
Cobra Metal Hose Div., Chicago, Ill.
Dole Refrigerating Co., Chicago, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Flexible Tubing Corp., Guilford, Conn.
Flexonics Corp., Maywood, Ill.
Goodall Rubber Co., Trenton, N. J.
Imperial Brass Mfg. Co., Chicago, Ill.
International Metal Hose Co., Bellevue, O.
Johnson Metal Hose, Inc., Waterbury, Conn.
Marquette Coppersmithing Co., Philadelphia, Pa.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Newage International, Inc., Bala Cynwyd, Pa.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Perfecting Service Co., Charlotte, N. C.
Seamlex Co., Inc., Long Island City, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Titeflex, Inc., Newark, N. J.
United Metal Hose Co., Inc., Long Island City, N. Y.
Universal Metal Hose Co., Chicago, Ill.
Vibration Mounting, Inc., Elmhurst, N. Y.
Weatherhead Co., The, Cleveland, O.
Yardley Plastics Co., Columbus, O.
Zallea Brothers, Wilmington, Del.

HOSE, NON-METAL, AND FITTINGS

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
Aeroquip, Inc., Van Wert, O.
Ammerman Co., C. L., Minneapolis, Minn.
Anchor Coupling Co., Libertyville, Ill.
Anchor Packing Co., Philadelphia, Pa.
Arrowhead Rubber Co., Long Beach, Calif.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Continental Rubber Works, Erie, Pa.
De Vilbiss Co., The, Toledo, O.
Electric Hose & Rubber Co., Wilmington, Del.
Flexaust Co., New York, N. Y.
Flexible Tubing Corp., Guilford, Conn.
Gates Rubber Co., The, Denver, Colo.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Henry Valve Co., Melrose Park, Ill.

Hewitt-Robins Inc., Stamford, Conn.
New York Belting & Packing Co., Passaic, N. J.
Parker Appliance Co., The, Cleveland, O.
Polymer Corp. of Pa., The, Reading, Pa.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber and Tire Corp., Youngstown, O.
Resistoflex Corp., Belleville, N. J.
Roylyn, Inc., Glendale, Calif.
Snap-Tite, Inc., Union City, Pa.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Thermoid Co., Trenton, N. J.
Thor Power Tool Co., Aurora, Ill.
Titeflex, Inc., Newark, N. J.
United States Rubber Co., New York, N. Y.
Vibration Mounting, Inc., Elmhurst, N. Y.
Weatherhead Co., The, Cleveland, O.

HOSE, VENTILATING

See Ducts and Duct Fittings, Prefabricated, Non-Flexible, Non-Metallic

HOSPITAL OPERATING ROOM AIR CONDITIONING UNITS

See Units, Air Conditioning, Exclusively for Hospital Operating Rooms

HOT GAS DEFROSTING

See Systems, Hot Gas Defrosting for Refrigeration

HOT WATER HEATING SYSTEMS

See Systems, Heating, Hot Water

HOT WATER HEATING SYSTEMS, BALANCING ELBOWS FOR

See Elbows, Balancing, For Hot Water Heating System

HOT WATER PRESSURE REGULATORS

See Regulators, Pressure, Hot Water Heating Systems

HOUSINGS, FAN, CENTRIFUGAL

(Housing only—not complete fans)

Air Fan Engineering Co., Los Angeles, Calif.
Ammerman Co., C. L., Minneapolis, Minn.
Barry Blower Co., Minneapolis, Minn.
Bishop & Babcock Mfg. Co., Cleveland, O.
Brookside Products Co., Inc., McCordsville, Ind.
Brundage Co., The, Kalamazoo, Mich.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Clarage Fan Co., Kalamazoo, Mich.
Commercial Shearing & Stamping Co., Youngstown, O.
Detroit Stamping Co., Detroit, Mich.
General Blower Co., Morton Grove, Ill.
Hastings Air Control, Inc., Omaha, Nebr.
Haveg Corp., Newark, Del. (plastic for corrosive fumes)
Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago, Ill.
Morrison Products Inc., Cleveland, O.
Northern Blower Co., Cleveland, O.
Palmer Mfg. Corp., Phoenix, Ariz.
Revcor, Carpentersville, Ill.
Torit Mfg. Co., St. Paul, Minn.
United States Air Conditioning Corp., Minneapolis, Minn.
Utica Products, Inc., Utica, N. Y.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.

HOUSINGS, FAN, PROPELLER

(Housing only—not complete fans)

Allen Cooler & Ventilator, Inc., Rochester, Mich.
Ammerman Co., C. L., Minneapolis, Minn.
Brookside Products Co., Inc., McCordsville, Ind.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Commercial Shearing & Stamping Co., Youngstown, O.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
General Blower Co., Morton Grove, Ill.
Haveg Corp., Newark, Del. (plastic for corrosive fumes)
International Engineering, Inc., Dayton, O.
Kody Blower Co., Trenton, N. J.
Martin Fan & Blower Co., Chicago, Ill.
Palmer Mfg. Corp., Phoenix, Ariz.

HUMIDIFIERS, CENTRAL PLANT

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
American Blower Corp., Detroit, Mich.
American Foundry & Furnace Co., Bloomington, Ill.
American Moistening Co., Providence, R. I.
Armstrong Machine Wks., Three Rivers, Mich.
Bahnson Co., Winston-Salem, N. C.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Cleveland Humidifier Co., Cleveland, O.
Daffin Mfg. Co., Lancaster, Pa.
Farr Co., Los Angeles, Calif.
General Filters, Inc., Novi, Mich.
Johnson Service Co., Milwaukee, Wis.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla. (vaporizers for humidifiers)
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
National Engineering & Mfg. Co., Kansas City, Mo.
Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Powers Regulator Co., Skokie, Ill.
Research Products Corp., Madison, Wis.
Roberson Co., L. N., Seattle, Wash.
Southworth Machine Co., Portland, Me.
Steel Products Engineering Co., Springfield, O.
Surface Combustion Corp., Toledo, O.
Trane Co., The, LaCrosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis.
Walton Laboratories, Inc., Irvington, N. J.
York Corp., York, Pa.

HUMIDIFIERS, DIRECT, SPRAY HEAD

Abbeon Supply Co., Jamaica, N. Y.
American Moistening Co., Providence, R. I.
Auetsberger Bros., Inc., Northbrook, Ill.
Bahnson Co., Winston-Salem, N. C. (Centrifugal)
Binks Mfg. Co., Chicago, Ill.
Buffalo Forge Co., Buffalo, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Daffin Mfg. Co., Lancaster, Pa.
Drying Systems, Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Lennox Industries, Inc., Marshalltown, Ia.
Maid-O'-Mist, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
Murray Mfg. Co., D. J., Wausau, Wis.
Parks-Cramer Co., Fitchburg, Mass.
Rhode Island Humidifier & Ventilating Co., Boston, Mass.
Roberson Co., L. N., Seattle, Wash.
Ross Sprinkler Co., Rosemead, Calif.
Somers, Inc., H. J., Detroit, Mich.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Supreme Electric Products Corp., Rochester, N. Y.
Walton Laboratories, Inc., Irvington, N. J.

HUMIDIFIERS FOR RADIATORS AND CONVECTORS

Maid-O'-Mist, Inc., Chicago, Ill.
Skilbeck Mfg. Co., Kenosha, Wis.

HUMIDIFIERS, RADIATOR VENT VALVE

G & H Mfg. Co., Philadelphia, Pa.
Maid-O'-Mist, Inc., Chicago, Ill.
Skilbeck Mfg. Co., Kenosha, Wis.

HUMIDIFIERS, UNIT, ROOM TYPE (Without Heating)

Abbeon Supply Co., Jamaica, N. Y.
American Moistening Co., Providence, R. I.
Armstrong Machine Wks., Three Rivers, Mich.
Bahnson Co., Winston-Salem, N. C.
Daffin Mfg. Co., Lancaster, Pa.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Health Trola Div., Excel Heating & Air Conditioning Co., Chicago, Ill.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Murray Mfg. Co., D. J., Wausau, Wis.
National Engineering & Mfg. Co., Kansas City, Mo.
Palmer Mfg. Corp., Phoenix, Ariz.
Research Products Corp., Madison, Wis.
Somers, Inc., H. J., Detroit, Mich.
Spraying Systems Co., Bellwood, Ill.
Standard Engineering Wks., Pawtucket, R. I.
Tempmaster Corp., Kansas City, Mo.
Walton Laboratories, Inc., Irvington, N. J

HUMIDIFYING RADIATORS

See Radiators, Humidifying

HUMIDISTATS

Abbeon Supply Co., Jamaica, N. Y.
American Instrument Co., Silver Spring, Md.
American Moistening Co., Providence, R. I.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Parks-Cramer Co., Fitchburg, Mass.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Standard Engineering Wks., Pawtucket, R. I.
Walton Laboratories, Inc., Irvington, N. J.

HUMIDITY INDICATORS

See Indicator-Controllers, Relative Humidity; Psychrometers

HUMIDITY RECORDERS

See Recorders, Humidity

HUMIDITY AND TEMPERATURE CONTROLS

See Humidistats; Recorder-Controllers; Thermostats

HYDRAULIC PIPE PUSHERS

See Pushers, Pipe, Hydraulic

HYDRAULIC SPEED CHANGERS

See Changers, Speed, Hydraulic Coupling

HYGROMETERS

Airguide Instrument Co., Chicago, Ill.
Airserco Mfg. Co., Pittsburgh, Pa.
American Instrument Co., Inc., Silver Spring, Md.
American Moistening Co., Providence, R. I.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Scientific Equipment Co., Philadelphia, Pa.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electric Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Will Corp., Rochester, N. Y.

HYGROSTATS

See Humidistats

IDENTIFICATION MARKERS (For Piping Services)

Brady Co., W. H., Milwaukee, Wis.
North Shore Nameplate Inc., Bayside, N. Y.
Seton Name Plate Co., New Haven, Conn.
Western Lithograph Co., Los Angeles, Calif.
Wilmington Plastics Co., Wilmington, Del.

IMMERSION THERMOSTATS

See Thermostats, Immersion

INCINERATORS, FOR LARGE BUILDINGS

Flynn & Emrich Co., Baltimore, Md. (stoker type)
Gober Incinerator Corp., Chicago, Ill.
Harmond Company, Cleveland, O.
Johnston & Jennings Co., Cleveland, O.
Morse-Boulger Destructor Co., New York, N. Y.
Plibrico Co., Chicago, Ill.

INDICATING THERMOMETERS

See Thermometers, Indicating

INDICATOR-CONTROLLERS, PRESSURE

Automatic Control Co., St. Paul, Minn.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Control Engineering Corp., Controls Div., Norwood, Mass.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Giannini & Co., Inc., G. M., Pasadena, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

INDICATOR-CONTROLLERS, RELATIVE HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

INDICATOR-CONTROLLERS, TEMPERATURE

American Instrument Co., Inc., Silver Spring, Md.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Cybertronic Corp. of America, Chester, Pa.
Defender Instrument & Regulator Co., St. Louis, Mo.
Fenwal, Inc., Ashland, Mass.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Illinois Testing Laboratories, Inc., Chicago
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Wiegand Co., Edwin L., Pittsburgh, Pa.

INDICATORS, CARBON DIOXIDE, BOILER ROOM

For Portable CO_2 Analyzers See Analyzers, Carbon Dioxide, Portable

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Defender Instrument and Regulator Co., St. Louis, Mo.
Engelhard, Inc., Chas., Newark, N. J.
Ess Instrument Co., Bergenfield, N. J.
General Scientific Equipment Co., Philadelphia, Pa.
Hays Corp., Michigan City, Ind.
Permutit Co., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill.
Standard Instrument Div., Heat Timer Corp., New York, N. Y.
Uehling Instrument Co., Paterson, N. J.

INDICATORS, DEW POINT

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Illinois Testing Laboratories, Inc., Chicago
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Pittsburgh Lectrodryer Corp., Pittsburgh, Pa.

INDICATORS, FLOW

See Meters, Flow

INDICATORS, LIQUID LEVEL, BOILER AND TANK

Automatic Control Co., St. Paul, Minn.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Barton Instrument Corp., Los Angeles, Calif.
Boston Auto Gage Co., Pittsfield, Mass.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Cochrane Corp., Philadelphia, Pa.
Daytronic Corp., Dayton, O.
Defender Instrument & Regulator Co., St. Louis, Mo.
Detroit Brass & Malleable Co., Detroit, Mich.
Engelhard, Inc., Charles, East Newark, N. J.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Frick Co., Waynesboro, Pa.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Liquidepth Indicators, Inc., Long Island City, N. Y.
Magnetrol, Inc., Chicago, Ill.
Mason-Neilan Regulator Co., Boston, Mass.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Reliance Gauge Column Co., Cleveland, O.
Ripley Co., Inc., Middletown, Conn.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Swift Lubricator Co., Inc., Elmira, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Techniflex Corp., Port Jervis, N. Y.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Worner Electronic Devices, Rankin, Ill.
Yarnall-Waring Co., Philadelphia, Pa.

INDICATORS, pH

American Instrument Co., Inc., Silver Spring, Md.
Analytical Measurements, Inc., Chatham, N. J.
Bristol Co., The, Waterbury, Conn.
Calgon, Inc., Pittsburgh, Pa.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Leeds & Northrup Co., Philadelphia, Pa.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Thomas Co., Arthur H., Philadelphia, Pa.
Thwing-Albert Instrument Co., Philadelphia
Wallace & Tiernan Inc., Belleville, N. J.

INDICATORS, RELATIVE HUMIDITY

Abbeon Supply Co., Jamaica, N. Y.
Airguide Instrument Co., Chicago, Ill.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Instrument Co., Inc., Silver Spring, Md.
American Moistening Co., Providence, R. I.
~~Beekman & ~~Whitley, Inc., San Carlos, Calif.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Walton Laboratories, Inc., Irvington, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

INDICATORS, SOUND LEVEL

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Hermon Hosmer Scott, Inc., Cambridge, Mass.

INDIRECT HEATING SURFACE

See Surface, Finned, Heating

INDIRECT WATER HEATERS

See Heaters, Water, Indirect

INDUSTRIAL AIR CONDITIONERS

See Units, Air Conditioning, Industrial Type

INDUSTRIAL DRYERS

See Dryers, Industrial

INJECTOR RECIRCULATORS FOR REFRIGERANTS

- Phillips & Co., H. A., Chicago, Ill.

INSERTS, CONCRETE

- Air-Path Products Co., Baltimore, Md.
- Carty & Moore Engineering Co., Detroit, Mich.
- Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
- Grabler Mfg. Co., Cleveland, O.
- Healy Ruff Co., St. Paul, Minn.
- Hupp Corp., Globe Stamping Div., Cleveland, O.
- Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
- Rockwood Sprinkler Co., Worcester, Mass.
- Steel City Electric Co., Pittsburgh, Pa.
- Truscon Steel Div., Republic Steel Corp., Youngstown, O.
- Unistrut Products Co., Chicago, Ill.

INSTANTANEOUS WATER HEATERS

See Heaters, Water, Steam, Instantaneous

INSULATING CONCRETE

See Concrete, Insulating

INSULATION ANCHORS AND ADHESIVES

See Fasteners, Insulation

INSULATION, BOILER AND TANK

- Acme Asbestos Covering & Flooring Co., Chicago, Ill.
- Armstrong Cork Co., Lancaster, Pa. (amosite asbestos, glass fiber, mineral wool)
- Asbestos Asphalt Insulation Co., Chicago, Ill.
- Badham Insulation Co., Inc., Birmingham, Ala.
- Baldwin-Hill Co., Trenton, N. J. (Rock wool)
- Bigelow Liptak Corp., Detroit, Mich.
- Bird-Archer Co., Philadelphia, Pa.
- Botfield Refractories Co., Philadelphia, Pa.
- Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
- Eagle-Picher Co., Cincinnati, O.
- Ehret Magnesia Mfg. Co., Valley Forge, Pa. (Magnesia)
- Forty-Eight Insulations, Inc., Aurora, Ill.
- Grant Wilson Inc., Chicago, Ill.
- Green Fire Brick Co., Mexico, Mo.
- Insul-Mastic Corp., Pittsburgh, Pa.
- International Vermiculite Co., Girard, Ill.
- Johns-Manville, New York, N. Y.
- Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
- Keasbey & Mattison Co., Ambler, Pa.
- Krehbiel Co., J. H., Chicago, Ill.
- L.O.F. Glass Fibers Co., Toledo, O.
- Lockport Mills, Inc., Lockport, N. Y.
- MMM, Inc., Houston, Tex. (low temperature)
- Monsanto Chemical Co., Merimac Div., Boston, Mass.
- Mundet Cork Corp., North Bergen, N. J. (Cork)
- Munn and Steele, Inc., South Boston, Mass.
- National Cork Co., Englewood, N. J. (Corkboard)
- National Gypsum Co., Buffalo, N. Y. (Rock wool)
- Norristown Magnesia & Asbestos Co., Norristown, Pa. (Asbestos and magnesia)
- North American Asbestos Corp., Chicago, Ill.
- Owens-Corning Fiberglas Corp., Toledo, O. (block or board)
- Pabco Products Inc., San Francisco, Calif.
- Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
- Pittsburgh Corning Corp., Pittsburgh, Pa.
- Pittsburgh Plate Glass Co., Pittsburgh, Pa.
- Plibrico Co., Chicago, Ill.
- Poe Co., C. W., Cleveland, O.
- Quigley Co., Inc., New York, N. Y.
- Reflectal Corp., Subsidiary, Borg-Warner Corp., Chicago, Ill.
- Refractory & Insulation Corp., New York, N. Y. (Blanket, block, cement)
- Robinson Industries, Coleman, Mich. (expanded plastic)
- Ruberoid Co., New York, N. Y. (Asbestos, magnesia)
- Salt Mountain Co., Hamilton, O.
- Smith & Kanzler Corp., Linden, N. J.
- Spring Packing Corp., Chicago, Ill.
- Standard Asbestos Mfg. Co., Chicago, Ill.
- Standard Fuel Engineering Co., Detroit, Mich.
- Union Asbestos & Rubber Co., Chicago, Ill.
- United Cork Co., Kearney, N. J. (Cork)
- United States Mineral Wool Co., Stanhope, N. J. (loose wool)
- Walker Jamar Co., Duluth, Minn.
- Zonolite Co., Chicago, Ill. (plastic)

INSULATION, BUILDING

- Acme Asbestos Covering & Flooring Co., Chicago, Ill. (Rock wool)
- Alumiseal Corp., New York, N. Y.
- American Flange & Mfg. Co., Inc., New York, N. Y. (Metal sheets)
- Armstrong Cork Co., Lancaster, Pa. (Corkboard, fibre board, glass fiber)
- Badham Insulation Co., Inc., Birmingham, Ala.
- Baldwin-Hill Co., Trenton, N. J. (Rock wool)
- Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (Rock wool loose, batts)
- Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Rock wool)
- Carney Co., Inc., The, Mankato, Minn.
- Celotex Corp., The, Chicago, Ill.
- Chamberlin Co. of America, Detroit, Mich.
- Dodge Cork Co., Inc., Lancaster, Pa.
- Dow Chemical Co., The, Midland, Mich.
- Eagle-Picher Co., Cincinnati, O. (Loose, fill, batt and granulated)
- Flintkote Co., The, New York, N. Y.
- Forty-Eight Insulations, Inc., Aurora, Ill.
- Gustin-Bacon Mfg. Co., Kansas City, Mo.
- Infra Insulation, Inc., New York, N. Y. (reflective accordion, also asbestos)
- Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn. (Wool fibre)
- International Vermiculite Co., Girard, Ill. (Loose fill)
- Isoflex Corp., Redwood City, Calif.
- Johns-Manville, New York, N. Y. (Rock wool and wood fibre-board)
- Johnston Foil Mfg. Co., St. Louis, Mo. (Foil, aluminum, tin, lead)
- L.O.F. Glass Fibers Co., Toledo, O.
- Lockport Mills, Inc., Lockport, N. Y.
- Minnesota & Ontario Paper Co., Minneapolis, Minn.
- Miracle Adhesives Corp., New York, N. Y. (vapor barrier material)
- Multi-Cell Sales Corp., Minneapolis, Minn. (Blanket, quilted newspaper)
- Munn & Steele, Inc., South Boston, Mass.
- National Cork Co., Englewood, N. J. (Corkboard)
- National Gypsum Co., Buffalo, N. Y.
- Nelson Mfg. Co., B. F., Minneapolis, Minn.
- North American Asbestos Corp., Chicago, Ill.
- Owens-Corning Fiberglas Corp., Toledo, O.
- Pacific Lumber Co., The, San Francisco, Calif.
- Pittsburgh Corning Corp., Pittsburgh, Pa.
- Pittsburgh Plate Glass Co., Pittsburgh, Pa.
- Plastergon Wall Board Co., Buffalo, N. Y. (Rigid board)
- Poe Co., C. W., Cleveland, O.
- Rector Mineral Trading Corp., New York, N. Y.
- Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.
- Refractory & Insulation Corp., New York, N. Y. (Rock, slag wool)
- Reynolds Metals Co., Louisville, Ky.
- Rubatex Div., Great American Industries, Inc., Bedford, Va.
- Ruberoid Co., New York, N. Y.
- Silvercote Products, Inc., Chicago, Ill.
- Sprayo-Flake Co., Chicago, Ill.
- Standard Asbestos Mfg. Co., Chicago, Ill. (Asbestos, hairfelt)
- Tennessee Products and Chemical Corp., Nashville, Tenn.
- United Cork Companies, Kearny, N. J. (Cork)
- United States Gypsum Co., Chicago, Ill. (Wool and USG Ins. board)
- United States Pipe & Foundry Co., Birmingham, Ala. (mineral wool-batts and pellets)
- United States Mineral Wool Co., Stanhope, N. J. (Mineral wool, granulated wool, loose wool)
- Wilson & Co., Inc., Chicago, Ill. (Board)
- Wood Conversion Co., St. Paul, Minn.
- Zonolite Co., Chicago, Ill. (Loose fill)

INSULATION, DUCT, SOUND DEADENING

For Application Inside Duct

- American Hair & Felt Co., Chicago, Ill.
- Asbestos Asphalt Insulation Co., Chicago, Ill.
- Baldwin-Hill Co., Trenton, N. J.
- Celotex Corp., The, Chicago, Ill.
- Ehret Magnesia Mfg. Co., Valley Forge, Pa.
- Felters Company, The, Boston, Mass.
- Flintkote Co., The, New York, N. Y.
- Grant Wilson, Inc., Chicago, Ill.
- Gustin-Bacon Mfg. Co., Kansas City, Mo.
- Industrial Acoustics Co., New York, N. Y.
- Industrial Sound Control, Inc., Hartford, Conn. (packaged unit to incorporate in duct work for quieting air and noise)
- Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.
- Inter-Coastal Paint Corp., East St. Louis, Ill.
- Johns-Manville, New York, N. Y. (mineral wool)
- L.O.F. Glass Fibers Co., Toledo, O.
- Lockport Mills, Inc., Lockport, N. Y.
- Minnesota Mining & Mfg. Co., St. Paul, Minn.
- Mortell Co., J. W., Kankakee, Ill.
- Norristown Magnesia & Asbestos Co., Norristown, Pa.
- Owens-Corning Fiberglas Corp., Toledo, O.
- Sprayo-Flake Co., Chicago, Ill.
- Thompson and Co., Oakmont, Pa.
- United States Rubber Co., New York, N. Y.
- Wood Conversion Co., St. Paul, Minn.
- Zonolite Co., Chicago, Ill.

INSULATION, DUCT, THERMAL

- Acme Asbestos Covering & Flooring Co., Chicago, Ill. (Asbestos)
- American Flange & Mfg. Co., Inc., New York, N. Y.
- American Hair & Felt Co., Chicago, Ill. (Hair felt)
- Armstrong Cork Co., Lancaster, Pa. (Corkboard, glass fiber)
- Asbestos Asphalt Insulation Co., Chicago, Ill.
- Badham Insulation Co., Inc., Birmingham, Ala.
- Baldwin-Hill Co., Trenton, N. J.
- Bigelow Liptak Corp., Detroit, Mich.
- Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asbestos)
- Celotex Corp., The, Chicago, Ill.
- Dow Chemical Co., The, Midland, Mich.
- Eagle-Picher Co., Cincinnati, O. (Mineral wool blankets)
- Ehret Magnesia Mfg. Co., Valley Forge, Pa. (Cork, magnesia, hair felt)
- Felters Company, The, Boston, Mass. (Wool felt)
- Flintkote Co., The, New York, N. Y. (fibrated, asphalt spray-On)
- Forty-Eight Insulations, Inc., Aurora, Ill.
- Grant Wilson Inc., Chicago, Ill.
- Gustin-Bacon Mfg. Co., Kansas City, Mo.
- Hinde & Dauch Paper Co., Sandusky, O.
- Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa. (aluminum)
- Infra Insulation, Inc., New York, N. Y.
- Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn. (Wood fibre)
- Insul-Mastic Corp., Summit, Ill.
- International Vermiculite Co., Girard, Ill. (Block)
- Isoflex Corp., Redwood City, Calif.
- Johns-Manville, New York, N. Y. (Mineral wool)
- Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
- Keasbey & Mattison Co., Ambler, Pa. (Asbestos)
- L.O.F. Glass Fibers Co., Toledo, O.
- Lockport Mills, Inc., Lockport, N. Y.
- Lynch Asbestos Co., Los Angeles, Calif. (asbestos & foil aircells)
- Minnesota Mining & Mfg. Co., St. Paul, Minn.
- Miracle Adhesives Corp., New York, N. Y. (prefabricated polyvinyl duct covering)
- Mortell Co., J. W., Kankakee, Ill.
- Mundet Cork Corp., North Bergen, N. J. (Cork)
- Munn and Steele, Inc., South Boston, Mass.
- National Cork Co., Englewood, N. J. (Corkboard)

Norristown Magnesia & Asbestos Co., Norristown, Pa. (Asbestos and wool felt)
Owens-Corning Fiberglas Corp., Toledo, O. (Blanket)
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Poe Co., C. W., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Rector Mineral Trading Corp., New York, N. Y.
Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y. (Mineral wool blanket)
Reynolds Metals Co., Louisville, Ky.
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Ruberoid Co., New York, N. Y. (Asbestos cellular and laminated sheets or blocks)
Sall Mountain Co., Hamilton, O. (Asbestos)
Smith & Kanzler Corp., Linden, N. J. (Asbestos air cell type)
Sprayo-Flake Co., Chicago, Ill.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill. (Asbestos, hair felt)
United Cork Companies, Kearny, N. J. (Cork)
United States Mineral Wool Co., Stanhope, N. J.
Wilson & Co., Inc., Chicago, Ill.
Wood Conversion Co., St. Paul, Minn.
Zonolite Co., Chicago, Ill. (plastic)

INSULATION FASTENERS AND ANCHORS

See Fasteners, Insulation

INSULATION, FINISHING CEMENT

Baldwin-Hill Co., Trenton, N. J.
Bigelow Liptak Corp., Detroit, Mich.
Carey Mfg. Co., Philip, Cincinnati, O.
Eagle-Picher Co., Cincinnati, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Forty-Eight Insulations, Inc., Aurora, Ill.
Grant Wilson, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Moore Inc., Goodloe E., Danville, Ill.
Mundet Cork Corp., N. Bergen, N. J. (mineral wool)
North American Asbestos Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y.
Ruberoid Co., New York, N. Y.
Sall Mountain Co., Hamilton, O. (asbestos)
Standard Asbestos Mfg. Co., Chicago, Ill.

INSULATION, PIPE

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
American Gilsonite Co., Salt Lake City, Utah (hot, underground)
American Hair & Felt Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa. (Cork, glass fiber, amosite asbestos, flexible foamed plastic)
Asbestos Asphalt Insulation Co., Chicago, Ill.
Atlas Mineral Products Co., Mertztown, Pa.
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Hill Co., Trenton, N. J. (Rock wool)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asbestos, magnesia)
Dow Chemical Co., The, Midland, Mich.
Durant Insulated Pipe Co., Palo Alto, Calif. (Underground)
Durant International Corp., Williamstown, N. J. (underground)
Eagle-Picher Co., Cincinnati, O. (Mineral wool)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Forty-Eight Insulations, Inc., Aurora, Ill.
Grant Wilson Inc., Chicago, Ill. (85% magnesium, air-cell, woolfelt, anti-sweat, frost proof, sponge felt.)
Gustin-Bacon Mfg. Co., Kansas City, Mo. (Molded fine glass fiber)
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa. (reflective)
Infra Insulation, Inc., New York, N. Y.
Insul-Mastic Corp., Summit, Ill. (asphalt-cork)
International Vermiculite Co., Girard, Ill. (Vermiculite)
Johns-Manville, New York, N. Y. (Asbestos, magnesia, rock cork)
Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
Keasbey Co., Robert A., New York, N. Y. (Asbestos and cork) (hair felt on cold side)
Keasbey & Mattison Co., Ambler, Pa. (Asbestos, magnesia)
L.O.F. Glass Fibers Co., Toledo, O.
Lockport Mills, Inc., Lockport, N. Y.
M M M, Inc., Houston, Tex. (low temperature)
Minnesota Mining & Mfg. Co., St. Paul, Minn. (Spray)
Miracle Adhesives Corp., New York, N. Y. (prefabricated polyvinyl pipe covering finish)
Mortell Co., J. W., Kankakee, Ill. (plastic cork)
Mundet Cork Corp., North Bergen, N. J. (Cork)
Munn and Steele, Inc., South Boston, Mass.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
National Cork Co., Englewood, N. J. (Corkboard)
Norristown Magnesia & Asbestos Co., Norristown, Pa. (Asbestos, magnesia)
North American Asbestos Corp., Chicago, Ill.
Owens-Corning Fiberglas Corp., Toledo, O.
Pabco Products Inc., San Francisco, Calif.
Pacific States Felt Mfg. Co., Inc., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa. (cellular glass)
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Poe Co., C. W., Cleveland, O.
Porter & Co., Inc., H. W., Newark, N. J. (Underground)
Reflectal Corp., Subsid. Borg-Warner Corp., Chicago, Ill (foil and corrugated paper)
Rector Mineral Trading Corp., New York, N. Y.
Ric-wiL, Inc., Barberton, O. (hot or cold)
Robinson Industries, Coleman, Mich. (expanded plastic)
Ruberoid Co., New York, N. Y. (Asbestos, calsilite)
Sall Mountain Co., Hamilton, O. (Asbestos and wool felt)
Smith & Kanzler Corp., Linden, N. J. (Asbestos air cell, wool felt and hair felt)
Sponge Products Div., B. F. Goodrich Co., Shelton, Conn.
Spring Packing Corp., Chicago, Ill. (asphaltic)
Standard Asbestos Mfg. Co., Chicago, Ill.
Surface Chemicals, Inc., McKees Rock, Pa.
Union Asbestos & Rubber Co., Chicago, Ill.
United Cork Companies, Kearny, N. J.
Walker Jamar Co., Duluth, Minn.
Wilson & Co., Chicago, Ill. (hairfelt)
Wood Conversion Co., St. Paul, Minn.
Wrap-On Co., Chicago, Ill. (Glass fiber and flexible tape)
Zonolite Co., Chicago, Ill. (underground)

INTAKES FOR OUTDOOR AIR, WALL OR ROOF, EQUIPPED WITH FILTERS

Muckle Mfg. Co., Owatonna, Minn.

IONIZATION APPARATUS

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Illinois Water Treatment Co., Rockford, Ill.
Ionaire, Inc., San Francisco, Calif.
Montgomery Bros., San Francisco, Calif.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.
Wesix Electric Heater Co., San Francisco, Calif.

IRON BODY VALVES

See Valves, Gate; and Valves, Globe

JACKETED PIPE

See Pipe, Jacketed

JACKETING FOR PIPE INSULATION

See Protectors, Pipe Covering

JETS, OVERFIRE AIR, FOR SMOKE ABATEMENT

Canton Stoker Corp., Canton, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
McNeill Smoke Eliminator Co., Chicago, Ill.
North American Mfg. Co., Cleveland, O.
Power Engineering Co., Chicago, Ill.
Reintjes Co., Geo. P., Kansas City, Mo.
Sterns-Flinn Corp., New York, N. Y.

JOINTS, PIPE, ELECTRICAL INSULATING

American Hard Rubber Co., New York, N. Y.
Barco Mfg. Co., Barrington, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Universal Controls Corp., Dallas, Tex.

JOINTS, PIPE, EXPANSION, FOR BASEBOARD HEATING

Clifford Mfg. Co., Div. of Standard-Thompson Corp., Waltham, Mass.
Flexonics Corp., Maywood, Ill.
Northern Indiana Brass Co., Elkhart, Ind.
Webster & Co., Warren, Camden, N. J.

JOINTS, PIPE, EXPANSION, PACKLESS, METAL

American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Badger Fire Extinguisher Co., Somerville, Mass.
Badger Mfg. Co., Cambridge, Mass. (Corrugated copper, stainless steel)
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Cook Electric Co., Chicago, Ill.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexonics Corp., Maywood, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Kopperman & Sons, Joseph, Philadelphia, Pa.
Marquette Coppersmithing Co., Philadelphia, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa.
Ric-wiL, Inc., Barberton, O.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Solar Aircraft Co., San Diego, Calif.
Techniflex Corp., Port Jervis, N. Y.
Zallea Brothers, Wilmington, Del.

JOINTS, PIPE, EXPANSION, PACKLESS, RUBBER

Garlock Packing Co., Palmyra, N. Y.
Goodall Rubber Co., Trenton, N. J.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
United States Rubber Co., New York, N. Y.

JOINTS, PIPE, EXPANSION, SLIP

American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Barco Mfg. Co., Barrington, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Heating Equipment Co., Detroit, Mich.
Moran Flexible Joint Co., Louisville, Ky.
Northern Indiana Brass Co., Elkhart, Ind.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Powell Co., Wm., Cincinnati, O.
Q-P Mfg. Co., Needham Heights, Mass.
Royalton Co., Inc., Gasport, N. Y.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
United States Gasket Co., Camden, N. J.
Walworth Co., New York, N. Y.
Yarnall-Waring Co., Philadelphia, Pa.

JOINTS, PIPE, FLEXIBLE, SWING AND REVOLVING

Barco Mfg. Co., Barrington, Ill.
Bordo Co., Inc., L. J., Glenside, Pa.
Chiksan Co., Brea, Calif.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexo Supply Co., Inc., St. Louis, Mo.
Johnson Corp., The, Three Rivers, Mich.
Mayson Mfg. Co., Detroit, Mich.
Moran Flexible Joint Co., Inc., Louisville, Ky.
OPW Corp., Cincinnati, O.
Perfecting Service Co., Charlotte, N. C.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Powell Co., Wm., Cincinnati, O.
Spincraft, Inc., Milwaukee, Wis.

JOINTS, UNIVERSAL, FOR OPERATING VALVES

Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich.
Brooks Equipment Corp., Hoboken, N. J.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Piezo Mfg. Corp., Staten Island, N. Y.

KATA THERMOMETERS

See Thermometers, Kata

KITS, COMBUSTION TESTING

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Hays Corp., Michigan City, Ind.
Victory Engineering Corp., Union, N. J.

LACQUERS

See Enamels and Lacquers

LAGGING ADHESIVES

See Adhesives, for Pipe Covering

LAMPS, STERILIZING, FOR DUCT INSTALLATION

Cooper Hewitt Electric Co., Hoboken, N. J.
Fuller Co., D. William, Chicago, Ill.
General Electric Co., Lamp Div., Cleveland, O.
Hanovia Chemical & Mfg. Co., Newark, N. J.
Sampson Chemical & Pigment Corp., Chicago, Ill.
Sperti, Faraday, Inc., Hoboken, N. J.
Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.

LEAD PIPE

See Pipe and Tubing, Lead and Lead Alloy

LEAD SHEETS

See Sheets, Lead

LEAD TUBING

See Pipe and Tubing, Lead and Lead Alloy

LEAK DETECTORS

See Detectors, Leak, Refrigerant

LEATHER PACKING

See Packing, Leather

LIFT GATES AND LIFT TRUCKS

See Gates, Lift; Trucks, Lift

LIGHTS, PILOT AND SIGNAL

General Electric Co., Construction Materials Div., Bridgeport, Conn.
General Electric Co., Lamp Div., Cleveland, O.
Hart Mfg. Co., The, Hartford, Conn.
Hubbell Corp., Mundelein, Ill. (for solenoid valves)
Kulka Electric Mfg. Co., Inc., Mt. Vernon, N. Y.
Pyle-National Co., The, Chicago, Ill.
Signal Indicator Co., Brooklyn, N. Y.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Westinghouse Electric Corp., Pittsburgh, Pa.

LININGS, TANK

Acker Organization, Inc., W. M., Meridian, Miss.
Amercoat Corp., South Gate, Calif.
Carboline Co., The, St. Louis, Mo.
Corite Products, Inc., Chicago, Ill. (plastic)
Corrosion Control Co., Inc., New York, N. Y.
Elastic Porcelain Lining Corp., Rochester, N. Y.
Gates Engineering Co., Wilmington, Del.
Heil Process Equipment Corp., Cleveland, O.
Heresite & Chemical Co., Manitowoc, Wis. (Phenolic and sheet rubber coatings)
Industrial Filter & Pump Co., Chicago, Ill.
Norwood Associated Engineers, Inc., Springfield, Mass.
Porce-Lin Tank Lining Co., Detroit, Mich.
Wilbur & Williams Co., Brighton, Mass.

LINKS, FUSIBLE

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Register Corp., Cedar Grove, N. J.
Grinnell Co., Inc., Providence, R. I.
Morse-Smith-Morse, Inc., Watertown, Mass.
Preferred Utilities Mfg. Corp., New York, N. Y.

LIQUID LEVEL GAGES

See Gages, Liquid Level

LIQUID LEVEL INDICATORS

See Indicators, Liquid Level

LIQUID LEVEL RECORDERS

See Recorders, Liquid Level

LIQUID LEVEL REGULATORS

See Regulators, Liquid Level

LIQUID PRESSURE REGULATORS

See Regulators, Pressure, Liquid

LOCATORS, PIPE, UNDERGROUND

Fisher Research Laboratory, Inc., Palo Alto, Calif.
Globe Phone Mfg. Co., Reading, Mass.
Radioactive Products Inc., Ferndale, Mich.
Wilkinson Products Co., Pasadena, Calif.

LOCK FORMING MACHINES

See Machines, Pittsburgh Lock Forming

LOCK NUTS

See Nuts, Lock

LOUVERS AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

Acme Equipment Co., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.
Air Conditioning Engineering Co., Cambridge, Mass.
Air Conditioning Products Co., Detroit, Mich.
Air & Refrigeration Corp., New York, N. Y.
Airmaster Corp., Chicago, Ill.
Air-Path Products Co., Baltimore, Md.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Coolair Corp., Jacksonville, Fla.
American Foundry & Furnace Co., Bloomington, Ill.
American Metal Works, Inc., New Orleans, La.
American Steel Band Co., Pittsburgh, Pa.
American Warming & Ventilating Co., Toledo, O.
Ammerman Co., C. L., Minneapolis, Minn.
Arex Co., Chicago, Ill.
Belco Industries, Inc., St. Louis, Mo.
Biersach & Niedermeyer Co., Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Burt Mfg. Co., Akron, O.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Commercialaire, Inc., Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Dual-Air Fan Co., Hampshire, Ill.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Elgo Shutter & Mfg. Co., Detroit, Mich.
Empire Ventilation Equipment Co., Long Island City, N. Y. (stationary)
Frigid, Inc., Brooklyn, N. Y.
General Blower Co., Morton Grove, Ill.
Ilg Electric Ventilating Co., Chicago, Ill.
Imperial Damper Co., New York, N. Y.
Independent Register Co., Cleveland, O.
International Engineering, Inc., Dayton, O.
Jamieson Mfg. Co., Dallas, Tex.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Lemlar Mfg. Co., Gardena, Calif.
Martin Fan & Blower Co., Chicago, Ill.
Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Muckle Mfg. Co., Owatonna, Minn.
Murray Co. of Texas, The, Atlanta, Ga.
Peerless Electric Co., Warren, O.
Phil Rich Fan Mfg. Co., Houston, Tex.
Reed Unit-Fans, Inc., New Orleans, La.
Register & Grille Mfg. Co., Brooklyn, N. Y.
Rittling Corp., The, Buffalo, N. Y.
Robbins & Myers, Inc., Fan Div., Memphis, Tenn.
Robertson Co., H. H., Pittsburgh, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.
Signal Electric Div. of King-Seeley Corp., Menominee, Mich.
Sioux Steel Co., Sioux Falls, S. D.
Sommerfield, Inc., Lou, New York, N. Y.
Standard Stamping & Perforating Co., Chicago, Ill.
Swartwout Co., The, Cleveland, O.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Gypsum Co., Chicago, Ill.
United States Register Co., Battle Creek, Mich.
Uno Ventilator Co., Malden, Mass.
Utility Appliance Corp., Los Angeles, Calif.
Van Noorden Co., E., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

LOUVERS, SUN REFLECTING

Kawneer Co., Niles, Mich.
Lemlar Mfg. Co., Gardena, Calif.

LOW WATER CUT-OFFS

See Cut-offs, Low Water, Heating Boiler

LUBRICANTS, VALVE STEM

Gulf Oil Corp., Pittsburgh, Pa.
Jet-Lube, Inc., Burbank, Calif.

MACHINES, BALANCING

See Equipment, Balancing

MACHINES, BLUE PRINT AND WHITE PRINT

For Reproducing Engineering Drawings

American Photocopy Equipment Co., Chicago, Ill. (for photocopy work)
Bruning Co., Inc., Charles, Chicago, Ill.
Dietzgen Co., Eugene, Chicago, Ill.
Ozalid Div. of General Aniline & Film Corp., Johnson City, N. Y.
Paragon-Revolute Corp., Rochester, N. Y.
Pease Co., C. F., The, Chicago, Ill.

MACHINES AND FILM, X-RAY

du Pont de Nemours & Co., E. I., Photo Products Dept., Wilmington, Del. (film only)
Eastman Kodak Co., Rochester, N. Y.
Keleket X-Ray Corp., Covington, Ky.
North American Philips Co., Inc., Mt. Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.

MACHINES, FLARING, PIPE AND TUBE

Chicago Pneumatic Tool Co., New York, N. Y.
Springload Mfg. Corp., Seattle, Wash. (Tenoning)
Wilson Co., K. R., Arcade, N. Y.

MACHINES, PIPE CLEANING

Continental Machine Co., Chicago, Ill.
Fennelly Co., J. C., San Francisco, Calif.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Spartan Tool Co., Chicago, Ill.
Wilson, Inc., Thomas C., Long Island City, N. Y.

MACHINES, PIPE CUTTING AND THREADING, PORTABLE

Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.
Landis Machine Co., Inc., Waynesboro, Pa.
Muncie Gear Wks., Inc., Muncie, Ind.
Obear & Son, W. F., Inglewood, Calif.
Oster Mfg. Co., Cleveland, O.
Ridge Tool Co., Elyria, O. (Hand)
Thread-Ezy Mfg. Co., Corunna, Mich.
Toledo Pipe Threading Machine Co., Toledo, O.

Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.

MACHINES, PIPE CUTTING AND THREADING, STATIONARY

Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.
Kalamazoo Tank & Silo Co., Machine Tool Div., Kalamazoo, Mich.
Landis Machine Co., Inc., Waynesboro, Pa.
Obear & Son, W. F., Inglewood, Calif.
Oster Mfg. Co., Cleveland, O.
Ridge Tool Co., Elyria, O.
Saunders Machine & Tool Corp., Yonkers, N. Y.
Stratford Pipe Scalloper Co., Clearwater, Fla.
Toledo Pipe Threading Machine Co., Toledo, O.

MACHINES, PITTSBURGH LOCK FORMING

Birks Mfg. Co., Meridan, Conn. (Pittsburgh lock seam opener)
Lockformer Co., Chicago, Ill.
Maplewood Machinery Co., Inc., Chicago, Ill.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Speed-Seam Co., Chicago, Ill.

MACHINES, REFRIGERATION, ABSORPTION

Carrier Corp., Syracuse, N. Y.
Servel, Inc., Evansville, Ind.
Vogt Machine Co., Henry, Louisville, Ky.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

MACHINES, SLIP ROLL FORMING

Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bertsch & Co., Inc., Cambridge City, Ind.
Hendley & Whitmore Co., Beloit, Wis.
Kling Bros. Engineering Wks., Chicago, Ill.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
San Angelo Foundry & Machine Co., San Angelo, Tex.
Webb Corp., The, Webb City, Mo.
Wysong & Miles, Inc., Greensboro, N. C.

MACHINES, TESTING, WELD

Air Reduction Sales Co., New York, N. Y.
Dillon & Co., Inc., W. C., Van Nuys, Calif.
Olsen Testing Machine Co., Tinius, Willow Grove, Pa.
Radioactive Products, Inc., Ferndale, Mich.

MACHINES, TRENCHING, FOR PIPE LINES

Auburn Machine Works, Inc., Auburn, Nebr.
Clipper Mfg. Co., Kansas City, Mo.
Parsons Co., Div. of Koehring Co., Newton, Ia.

MACHINES, TUBE FINNING

United Machinery Sales Co., Chicago, Ill.

MAGNESIUM ALLOY SHEETS

See Sheets, Magnesium Alloy

MAGNESIUM TUBING

See Tubing, Magnesium

MALLEABLE UNIONS

See Unions, Malleable

MANIFOLDS AND HEADERS, PREFABRICATED, FOR HEATING SYSTEMS

Acheson Mfg. Co., Rankin, Pa.
Dahl, G. W., Bristol, R. I.
Dunham Co., C. A., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I
Hi-Flow Products, Inc., Copiague, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Shaw-Kendall Engineering Co., Toledo, O.
Super Radiator Corp., Minneapolis, Minn.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.

MANIFOLDS, REFRIGERATION

Frick Co., Waynesboro, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Mueller Brass Co., Port Huron, Mich.
Reco Products Div., Recony Corp., New York, N. Y.
Super Radiator Corp., Minneapolis, Minn.
Superior Valve and Fittings Co., Pittsburgh, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., Milwaukee, Wis.
York Corp., York, Pa.

MANOMETERS

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Meter Co., Inc., Philadelphia, Pa.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Elgin Softener Corp., Elgin, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Flow Corp., Cambridge, Mass. (micro)
Hastings Instrument Co., Inc., Warwick, Va.
Hill & Co., E. Vernon, Lake Geneva, Wis.
King Engineering Corp., Ann Arbor, Mich.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Inst. Labs. Inc., Riverdale, Md.
Norwalk Valve Co., South Norwalk, Conn.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Simplex Valve & Meter Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Wallace & Tiernan Inc., Belleville, N. J.
Will Corp., Rochester, N. Y.

MARKERS, PIPE, HOLE AND SADDLE

Contour Marker Corp., Compton, Calif.
Jewel Mfg. Co., St. Paul, Minn.

MECHANICAL DRIVE TURBINES

See Turbines, Mechanical Drive

MECHANICAL SPEED CHANGERS

See Changers, Speed, Mechanical

MECHANICAL TRAPS

See Traps, Steam, Mechanical

MERCURY SWITCHES

See Switches, Mercury

METAL HOSE

See Hose, Flexible, Metal and Fittings

METAL, POROUS, FOR FILTRATION, SEPARATION, DIFFUSION AND FLOW CONTROL

Keystone Carbon Co., Inc., St. Marys, Pa.
Moraine Products Div., General Motors Corp., Dayton, O.
Wabash Corp., Chicago, Ill.

METALLIC BELLOWS

See Bellows, Thermostatic and Metallic

METALLIC PACKING

See Packing, Metallic

METERS, AIR VELOCITY, DIRECT READING

Air Devices, Inc., New York, N. Y.
Anemostat Corp. of America, New York, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Hastings Instrument Co., Inc., Warwick, Va.
Illinois Testing Laboratories, Inc., Chicago.
Taylor Instrument Companies, Rochester, N. Y.

METERS, BTU, FOR MEASURING FLOW AND TEMPERATURE AND CALIBRATED IN BTU OR THERMS

Bailey Meter Co., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.

METERS, CONDENSATE

American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Buffalo Meter Co., Buffalo, N. Y.
Central Station Steam Co., Detroit, Mich.
Neptune Meter Co., New York, N. Y.

METERS, FLOW, GAS OR AIR

American Meter Co., Inc., Philadelphia, Pa.
Aquatrol Ferr-X Corp., Clifton, N. J.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Daytronic Corp., Dayton, O.
Defender Instrument & Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Fischer & Porter Co, Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hastings Instrument Co., Inc., Warwick, Va.
Hays Corp., Michigan City, Ind.
Henszey Co., Watertown, Wis.
King Engineering Corp., Ann Arbor, Mich.
Liquid Carbonic Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Instrument Laboratories, Inc., Riverdale, Md.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Selas Corp. of America, Philadelphia, Pa.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.

METERS, FLOW, REFRIGERANT

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Landsdale, Pa.
Builders- Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Moore Products Co., Philadelphia, Pa.
Neptune Meter Co., New York, N. Y.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Trimount Instrument Co., Chicago, Ill.
United States Gauge, Div. of American Machine and Metals, Inc., Sellersville, Pa.

METERS, FLOW, STEAM

American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
King Engineering Corp., Ann Arbor, Mich.
Mason-Neilan Regulator Co., Boston, Mass.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.

National Instrument Laboratories, Inc., Riverdale, Md.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.

METERS, PROCESS LIQUID

American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Buffalo Meter Co., Buffalo, N. Y.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Control Engineering Corp., Controls Div., Norwood, Mass.
Daytronic Corp., Dayton, O.
Drage Products, Inc., Union City, N. J.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Granberg Corp., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Mason-Neilan Regulator Co., Boston, Mass.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Neptune Meter Co., New York, N. Y.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Simplex Valve & Meter Co., Philadelphia, Pa.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.
Worthington-Gamon Meter Div., Worthington Corp., Newark, N. J.

METERS, VOLUME, AIR AND GAS

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Meter Co., Inc., Philadelphia, Pa.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Granberg Corp., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hastings Instrument Co., Inc., Warwick, Va.
Hays Corp., Michigan City, Ind.
Meriam Instrument Co., The, Cleveland, O.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Roots-Connersville Blower Div., Connersville, Ind.
Schutte and Kerting Co., Cornwells Heights, Bucks County, Pa.
Selas Corp. of America, Philadelphia, Pa.
Simplex Valve & Meter Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Uehling Instrument Co., Paterson, N. J.
Wallace & Tiernan, Inc., Belleville, N. J.

METERS, WATER

American Moistening Co., Providence, R. I.
Aquatrol Ferr-X Corp., Clifton, N. J.
Brooks Rotameter Co., Lansdale, Pa.
Buffalo Meter Co., Buffalo, N. Y.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., The, Michigan City, Ind.
Hersey Mfg. Co., South Boston, Mass.
Neptune Meter Co., New York, N. Y.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Simplex Valve & Meter Co., Philadelphia, Pa.
Union Water Meter Co., Worcester, Mass.
Worthington-Gamon Meter Div., Worthington Corp., Newark, N. J.

MIXING VALVES

See Valves, Mixing, Steam and Water

MODULATING VALVES

See Valves, Radiator, Steam and Hot Water Modulating

MOTOR BASES

See Bases and Pads, Vibration Isolating; Bases, Motor Tension Adjusting

MOTOR CONTROLLERS

See Controllers and Starters, Motor

MOTOR OPERATED VALVES

See Valves, Motor Operated

MOTOR-PUMP UNITS

See Pump-Motor Units, Self-Contained

MOTOR STARTERS

See Controllers and Starters, Motor

MOTORS, COMPRESSED AIR POWERED

Chicago Pneumatic Tool Co., New York, N. Y.
Detroit Hoist & Machine Co., Detroit, Mich.
Gardner-Denver Co., Quincy, Ill.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Leiman Bros., Inc., Newark, N. J.

MOTORS, ELECTRIC, FRACTIONAL HP

ACEC Electric Corp., New York, N. Y.
Acro Mfg. Co., The, Columbus, O.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Alliance Mfg. Co., Inc., Alliance, O. (Shaded pole)
Baldor Electric Co., St. Louis, Mo.
Barber-Colman Co., Rockford, Ill.
Bluffton Electric Co., Bluffton, Ind.
Bodine Electric Co., Chicago, Ill.
Brown-Brockmeyer Co., Inc., Dayton, O.
Burke Electric Co., Div. of Marathon Electric Mfg. Corp., Erie, Pa.
Century Electric Co., St. Louis, Mo.
Clock & Timer Dept., General Electric Co., Ashland, Mass.
Crise Mfg. Co., The, Columbus, O.
Dayton Electric Mfg. Co., Chicago, Ill.
Delco Products Div., General Motors Corp., Dayton, O.
Diehl Mfg. Co., Somerville, N. J.
Doerr Electric Corp., Cedarburg, Wis.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Electric Motor Corp., Div. of Howard Industries, Inc., Racine, Wis.
Electric Motors & Specialties, Inc., Garrett, Ind.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fasco Industries, Inc., Rochester, N. Y.
Fairbanks, Morse & Co., Chicago, Ill.
Franklin Electric Co., Inc., Bluffton, Ind.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hansen Mfg. Co., Inc., Princeton, Ind.
Holtzer-Cabot Electric Motor Div., National Pneumatic Co., Inc., Boston, Mass.
Hoover Co., The, Electric Motor Div., North Plainfield, N. J.
Howard Industries, Inc., Racine, Wis. (shaded pole)
Howell Electric Motors Co., Howell, Mich.
Iron Fireman Mfg. Co., Cleveland, O.
Jack & Heintz, Inc., Cleveland, O.
Lamb Electric Co., Kent, O.
Leland Electric Co., The, Div. of American Machine & Foundry Co., Dayton, O.
Lima Electric Motor Co., The, Lima, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Marco Industries, Inc., Womelsdorf, Pa.
Master Electric Co., Dayton, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Co., The, Marceline, Mo., (Slow speed fan motors)
Morrill Motors, Ft. Wayne, Ind.
Newman Industries (America) Inc., New York, N. Y.
Ohio Electric Mfg. Co., The, Maple Heights, O.
Packard Electric Div., General Motors Corp., Warren, O.
Peerless Electric Co., Warren, O.
Portable Electric Tools, Inc., Chicago, Ill.
Redmond Co., Inc., Owosso, Mich.
Reynolds Electric Co., River Grove, Ill.
Ripley Co., Inc., Middletown, Conn.
Robbins & Myers, Inc., Springfield, O.
Royal Mfg. Corp., Waterloo, Ind.
Reuland Electric Co., Alhambra, Calif.
Small Motors Inc., Chicago, Ill.
Smith Corp., A. O., Electric Motor Div., Dayton, O.
Smith Corp., A. O., Milwaukee, Wis.
Sutton Corp., O. A., The, Wichita, Kans.
Thermador Electrical Mfg., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Universal Electric Co., Owosso, Mich.
Wagner Electric Corp., St. Louis, Mo.
Westinghouse Electric Corp., Pittsburgh, Pa.

MOTORS, ELECTRIC, 1 HP AND OVER

ACEC Electric Corp., New York, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Allis Co., Louis, The, Milwaukee, Wis.
Baldor Electric Co., St. Louis, Mo.
Brook Motor Corp., Chicago, Ill.
Brown-Brockmeyer Co., Inc., Dayton, O.
Burke Electric Co., Div. of Marathon Electric Mfg. Corp., Erie, Pa.
Byron Jackson Div., Borg-Warner Corp., Los Angeles, Calif. (submersible)
Century Electric Co., St. Louis, Mo.
Continental Electric Co., Inc., Newark, N. J.
Dayton Electric Mfg. Co., Chicago, Ill.
Delco Products Div., General Motors Corp., Dayton, O.
Diehl Mfg. Co., Somerville, N. J.
Doerr Electric Corp., Cedarburg, Wis.
Electric Machinery Mfg. Co., Minneapolis, Minn. (100 hp and over)
Electric Products Co., Cleveland, O.
Electro Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Elliott Co., Jeannette, Pa.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fairbanks, Morse & Co., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hertner Electric Co., The, Cleveland, O.
Hoover Co., The, Electric Motor Div., North Plainfield, N. J.
Howell Electric Motors Co., Howell, Mich.
Ideal Electric & Mfg. Co., Mansfield, O.
Imperial Electric Co., Akron, O.
Leland Electric Co., The, Div. of American Machine & Foundry Co., Dayton, O.
Lima Electric Motor Co., The, Lima, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Marble-Card Electric Co., Gladstone, Mich.
Master Electric Co., Dayton, O.
Moore Co., The, Marceline, Mo. (Slow speed fan motors)
Newman Industries (America) Inc., New York, N. Y.
Peerless Electric Co., Warren, O.
Reliance Electric & Engineering Co., Cleveland, O.
Reuland Electric Co., Alhambra, Calif.
Robbins & Myers, Inc., Springfield, O.
Smith Corp., A. O., Electric Motor Div., Dayton, O.
Smith Corp., A. O., Milwaukee, Wis.
Star-Kimble Motor Div., Miehle Prntg. Press & Mfg. Co., Bloomfield, N. J.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Wagner Electric Corp., St. Louis, Mo.
Westinghouse Electric Corp., Pittsburgh, Pa.

MOUNTINGS, VIBRATION

See Bases and Pads, Vibration Isolating

MUFFLERS, HOT GAS, FOR REFRIGERANT LINES

Armstrong Co., Richard M., West Chester, Pa.
Industrial Acoustics Co., New York, N. Y.

MUSHROOM HEATERS

See Heaters, Steam Jet, for Liquids

MUSHROOM VENTILATORS

See Ventilators, Mushroom

NAMEPLATES, STOCK WORDING FOR IDENTIFYING HEATING, PIPING AND AIR CONDITIONING EQUIPMENT AND CONTROLS

North Shore Nameplate Inc., Bayside, N. Y.
Seton Name Plate Co., New Haven, Conn.

NEUTRALIZERS, ACID

See Dehydrant and Acid Neutralizer

NEUTRALIZERS, ODOR

See Adsorbers, Odor

NICKEL AND NICKEL ALLOY PIPE AND FITTINGS

See Tubing, Nickel and Alloy; Fittings, Pipe, Nickel and Nickel Alloy; Pipe, Nickel and Nickel Alloy

NICKEL AND NICKEL ALLOY SHEETS

See Sheets, Nickel and Nickel Alloy

NIPPLES, PIPE, BRASS AND COPPER

Acheson Mfg. Co., Rankin, Pa.
Aeroquip, Inc., Van Wert, O.
Allen Mfg. Co., W. D., Chicago, Ill.
American Sanitary Mfg. Co., Abingdon, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Nipple Mfg. Co., Cicero, Ill.
Columbus Mfg. & Supply Co., Columbus, O.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
G & H Mfg. Co., Philadelphia, Pa.
Gilbert Brass Foundry Co., St. Louis, Mo.
Imperial Brass Mfg. Co., Chicago, Ill.
Keeney Mfg. Co., Newington, Conn.
Mueller Brass Co., Port Huron, Mich.
New York Brass Foundry, New York, N.Y.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Star Tubular Products Co., Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Tube Turns Plastics, Inc., Louisville, Ky. (PVC)
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Ware Coupling & Nipple Co., Ware, Mass.
Weatherhead Co., Cleveland, O.

NIPPLES, PIPE, FLEXIBLE

Johnson Metal Hose, Inc., Waterbury, Conn.
Lindy Heaters, Inc., New York, N. Y.
Techniflex Corp., Port Jervis, N. Y.

NIPPLES, PIPE, IRON AND STEEL

Aeroquip, Inc., Van Wert, O.
Albert Pipe Supply Co., Brooklyn, N. Y.
Allen Mfg. Co., W. D., Chicago, Ill.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Chicago Nipple Mfg. Co., Cicero, Ill.
Clow & Sons, James B., Chicago, Ill.
Columbus Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (Stainless steel and alloy only)
Illinois Malleable Iron Co., Chicago, Ill.
Ladish Co., Cudahy, Wis.
Larkin Packer Co., Inc., St. Louis, Mo.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Punch-Lok Co., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Star Tubular Products Co., Chicago, Ill.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Ware Coupling & Nipple Co., Ware, Mass.
Wheeling Machine Products Co., Wheeling, W. Va.

NIPPLES, PIPE, NICKEL AND NICKEL ALLOY

Camco Products, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Ladish Co., Cudahy, Wis.
Star Stainless Screw Co., Paterson, N. J.
Walworth Co., New York, N. Y.

NOISE ELIMINATION FOR COOLING TOWERS

Industrial Acoustics Co., New York, N. Y.
Industrial Sound Control, Inc., Hartford, Conn.
Vibration Mounting, Inc., Elmhurst, L. I., N. Y.

NOISE ELIMINATORS

See Bases and Pads, Vibration Isolating; Hose, Flexible, Metal and Fittings; Insulation, Duct, Sound Deadening

NOZZLES, ATOMIZING

American Moistening Co., Providence, R. I.
Bahnson Co., Winston-Salem, N. C.
Benjamin Air Rifle Co., St. Louis, Mo.
Bete Fog Nozzle Inc., Greenfield, Mass.
Binks Mfg. Co., Chicago, Ill.
Boston Machine Works Co., Lynn, Mass.
Carrier Corp., Syracuse, N. Y.
Delavan Mfg. Co., West Des Moines, Ia.
Eddington Metal Specialty Co., Eddington, Pa.
Engineer Co., New York, N. Y.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Parks Cramer Co., Fitchburg, Mass. (Industrial humidifier)
Ross Sprinkler Co., Rosemead, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Supreme Electric Products Corp., Rochester, N. Y.

NOZZLES, FLOODING

Bahnson Co., Winston-Salem, N. C.
Binks Mfg. Co., Chicago, Ill.
Spraying Systems Co., Bellwood, Ill.

NOZZLES, FLOW MEASURING

Able Metal Spinning & Stamping Co., Far Rockaway, N. Y.
Bailey Meter Co., Cleveland, O.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I. (open flow)
Defender Instrument & Regulator Co., St. Louis, Mo.
Delavan Mfg. Co., West Des Moines, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Mfg. Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.

NOZZLES, OIL BURNER

Balloffet Nozzle Co., Inc., Guttenberg, N. J.
Century Engineering Corp., Cedar Rapids, Ia.
Delavan Mfg. Co., West Des Moines, Ia.
Eddington Metal Specialty Co., Eddington, Pa.
Engineer Co., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Steinen Mfg. Co., Wm., Newark, N. J.

NOZZLES, SPARGER, FOR TANK HEATING

Heil Process Equipment Corp., Cleveland, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

NOZZLES, SPRAY

Allen Mfg. Co., W. D., Chicago, Ill.
American Cooling Tower Co., Kansas City, Mo.
American Moistening Co., Providence, R. I.
April Showers Co., Inc., Washington, D. C.
Bahnson Co., Winston-Salem, N. C.
Bayley Blower Co., Milwaukee, Wis.
Benjamin Air Rifle Co., St. Louis, Mo.
Bete Fog Nozzle Inc., Greenfield, Mass.
Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., The, Harrison, N. J.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chain Belt Co., Milwaukee, Wis.
Clarage Fan Co., Kalamazoo, Mich.
Delavan Mfg. Co., West Des Moines, Ia.
Duriron Co., Inc., Dayton, O.
Eddington Metal Specialty Co., Eddington, Pa.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Whittier, Calif.
General Ceramics Corp., Keasbey, N. J. (ceramic)
Gray Co., Inc., Minneapolis, Minn.
Harry Cooling Towers, Inc., New York, N. Y.
Link-Belt Co., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill. (air operated)
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Parks-Cramer Co., Fitchburg, Mass.
Plummer Spray Equipment Co., Napoleon, O.
Pritchard & Co., of California, J. F., Kansas City, Mo.
Rega Mfg. Co., Rochester, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Ross Sprinkler Co., Rosemead, Calif.
St. Clair Rubber Co., Detroit, Mich.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skinner Irrigation Co., Troy, O.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Stearns Co., N. C., Shreveport, La.
Steinen Mfg. Co., Wm., Newark, N. J.
Supreme Electric Products Corp., Rochester, N. Y.
TOT Towers, Inc., Houston, Tex.
Thermal Agency, Houston, Tex.
Water Cooling Equipment Co., St. Louis, Mo.
Yarnall-Waring Co., Philadelphia, Pa.

NUTS AND WASHERS, LOCK

Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grip Nut Co., Chicago, Ill.
Industrial Screw Co., Chicago, Ill.
Kwikon Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
MacLean-Fogg Lock Nut Co., Chicago, Ill.
Moore Inc., Goodloe E., Danville, Ill.
Republic Steel Corp., Cleveland, O.
Republic Steel Corp., Bolt & Nut Div., Cleveland, O.
Rockford Screw Products Co., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
SKF Industries, Inc., Philadelphia, Pa.
Shakeproof Div., Illinois Tool Wks., Elgin, Ill.
Standard Pressed Steel Co., Jenkintown, Pa.
Star Stainless Screw Co., Paterson, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Swallow Airplane Co., Wichita, Kan.
Tinnerman Products, Inc., Cleveland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.

OBSERVATION BOILER PORTS

See Ports, Observation, Boiler

ODOR ADSORBERS

See Filters, Air; Adsorbers, Odor

ODOR NEUTRALIZERS

See Adsorbers, Odor; Compounds, Air Freshening

OIL BURNERS

See Burners, Oil

OIL COOLERS

See Coolers, Oil

OIL, CUTTING, PIPE

Blue Seal Chemical Co., Roselle Park, N. J.
Capewell Mfg. Co., Hartford, Conn.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Gulf Oil Corp., Pittsburgh, Pa.
Hercules Chemical Co., Inc., New York, N. Y.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Cleveland, O.
Ridge Tool Co., Elyria, O.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Shell Oil Co., Lubricants Dept., Jackson Heights, Long Island, N. Y.
Standard Oil Co. of California, San Francisco, Calif.
Standard Oil Co. of Indiana, Chicago, Ill.
Suflo, Inc., Elizabeth, N. J.
Texas Co., The, New York, N. Y.
X Laboratories, Inc., New York, N. Y.

OIL, HEAT TRANSFER

Buxton Mfg. Co., Dover, N. J.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Gulf Oil Corp., Pittsburgh, Pa.
Monsanto Chemical Co., St. Louis, Mo.
Shell Oil Co., Lubricants Dept., Jackson Heights, Long Island, N. Y.
Socony Mobil Oil Co., Inc., New York, N. Y.
Standard Oil Co. of Indiana, Chicago, Ill.

OIL, REFRIGERATION

Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Frick Co., Waynesboro, Pa.
Gulf Oil Corp., Pittsburgh, Pa.
Houghton & Co., E. F., Philadelphia, Pa.
Illinois Oil Products, Inc., Rock Island, Ill.
Sealed Units Parts Co., Inc., Bronx, N. Y.
Shell Oil Co., Lubricants Dept., Jackson Heights, Long Island, N. Y.
Socony Mobil Oil Co., Inc., New York, N. Y.
Standard Oil Co. of California, San Francisco, Calif.
Standard Oil Co. of Indiana, Chicago, Ill.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.
Virginia Smelting Co., West Norfolk, Va.
York Corp., York, Pa.

OIL SEPARATORS

See Separators, Oil

OILERS, FOR REFRIGERATION COMPRESSORS

Refrigeration Devices Co., Nutley, N. J.

OILS, FOR COATING VISCOUS AIR FILTERS

Continental Air Filters Inc., Louisville, Ky.
Gulf Oil Co., Pittsburgh, Pa.
Standard Oil Co. of California, San Francisco, Calif.
Trion, Inc., McKees Rocks, Pa.
Vortox Co., Claremont, Calif.

OPERATORS, DAMPER, DUCT

Ace Instrument Co., Inc., Brooklyn, N. Y.
Acro Mfg. Co., The, Columbus, O.
Arens Controls, Inc., Evanston, Ill.
Au-Temp-Co Corp., New York, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Bressler Engineering Service, Oregon, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Conoflow Corp., Philadelphia, Pa.
Consolidated Metal Products Corp., Albany, N. Y.
Defender Instrument & Regulator Co., St. Louis, Mo.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hagan Corp., Pittsburgh, Pa.
Hart & Cooley Mfg. Co., Holland, Mich.
Heat-Timer Corp., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nichols Instruments Co., Baltimore, Md.
Powers Regulator Co., Skokie, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Shallcross Controls, Inc., Milwaukee, Wis.
Taylor Instrument Companies, Rochester, N. Y.
Wa-Trol, Houston, Tex.
Young Regulator Co., Cleveland, O.

OPERATORS, VALVE

Ace Instrument Co., Inc., Brooklyn, N. Y.
Arens Controls, Inc., Evanston, Ill.
Au-Temp-Co Corp., New York, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Babbitt Steam Specialty Co., New Bedford, Mass.
Barber-Colman Co., Rockford, Ill.
Benson, R. C., Pennsauken, N. J.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cameron Iron Works, Inc., Houston, Tex.
Conoflow Corp., Philadelphia, Pa.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., St. Louis, Mo.
De Zurik Shower Co., Sartell, Minn.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hanna Engineering Wks., Chicago, Ill.
Heat-Timer Corp., New York, N. Y.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Janette Electric Mfg. Co., Morton Grove, Ill.
Johnson Service Co., Milwaukee, Wis.
Kieley & Mueller, Inc., Middletown, N. Y.
Ledeen Mfg. Co., Los Angeles, Calif.
Mason-Neilan Regulator Co., Boston, Mass.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nichols Instruments Co., Baltimore, Md.
Okadee Co., Chicago, Ill.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Shallcross Controls, Inc., Milwaukee, Wis.
Techniflex Corp., Port Jervis, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Weighing Components, Inc., Hatboro, Pa.

ORIFICE FLANGES

See Flanges, Orifice

ORIFICE UNIONS

See Unions, Orifice

ORIFICES, FLOW MEASURING

Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Defender Instrument & Regulator Co., St. Louis, Mo.
Dole Valve Co., The, Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Madden Corp., The, Chicago, Ill.
Mason-Neilan Regulator Co., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Phoenix Products Co., Milwaukee, Wis. (spun metal)
Simplex Valve & Meter Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.

ORIFICES, RADIATOR

Au-Temp-Co Corp., New York, N. Y.
Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Tallmadge, Webster, Systems, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.

OVERFIRE AIR JETS

See Jets, Overfire Air, for Smoke Abatement

OVER-PRESSURE UNLOADERS, FOR REFRIGERANTS

Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Hubbell Corp., Mundelein, Ill.

OXY-ACETYLENE WELDING

See Welding and Cutting Apparatus, Oxy-Acetylene

OXYGEN PIPING AND REGULATING SYSTEMS

Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Melchoir, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.
National Cylinder Gas Co., Chicago, Ill.
Oxygen Equipment & Service Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.

OZONE APPARATUS

Montgomery Bros., San Francisco, Calif.
Norwood Associated Engineers Inc., Springfield, Mass.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

PACKAGED HEAT PUMP UNITS

See Unit, Air Conditioning, Reverse Refrigeration Cycle

PACKAGED STEAM GENERATORS

See Boilers, Packaged Units, Heating and Process

PACKING, ASBESTOS

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Crane Packing Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y.
Durabla Mfg. Co., New York, N. Y.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gatke Corp., Chicago, Ill.
Goodall Rubber Co., Trenton, N. J.
Goodyear Tire & Rubber Co., Akron, O.
Grant Wilson Inc., Chicago, Ill.
Greene, Tweed & Co., North Wales, Pa.
Hinde & Dauch Paper Co., Sandusky, O.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Linear Incorporated, Philadelphia, Pa.
Metallo Gasket Co., New Brunswick, N. J.
New York Belting & Packing Co., Passaic, N. J.
North American Asbestos Corp., Chicago, Ill.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Sall Mountain Co., Hamilton, O.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.

Union Asbestos & Rubber Co., Chicago, Ill.
United States Rubber Co., New York, N. Y.
Western Felt Works, Chicago, Ill.
Zimmerman Packing Co., Cincinnati, O.

PACKING, FIBER

Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Armstrong Cork Co., Lancaster, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Crane Packing Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y.
Durabla Mfg. Co., New York, N. Y.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Goodall Rubber Co., Trenton, N. J.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Linear Incorporated, Philadelphia, Pa.
Metallo Gasket Co., New Brunswick, N. J.
New York Belting & Packing Co., Passaic, N. J.
North American Asbestos Corp., Chicago, Ill.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Products Research Co., Los Angeles, Calif.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Rubber Co., New York, N. Y.
Zimmerman Packing Co., Cincinnati, O.

PACKING, LEATHER

Alexander Bros., Philadelphia, Pa.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Chicago Gasket Co., Chicago, Ill.
Excelsior Leather Washer Mfg. Co., Rockford, Ill.
Garlock Packing Co., Palmyra, N. Y.
Graton & Knight Co., Worcester, Mass.
Houghton & Co., E. F., Philadelphia, Pa.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Rhoads & Sons, J. E., Wilmington, Del.
Schieren Co., Chas. A., New York, N. Y.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Williams & Son, I. B., Dover, N. H.
Zimmerman Packing Co., Cincinnati, O.

PACKING, METALLIC

Abbott & Biddle Co., Philadelphia, Pa.
Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Conneaut Plastic Metallic Packing Co., Conneaut, O.
Crane Packing Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Linear Incorporated, Philadelphia, Pa.
National Engineering Products Inc., Washington, D. C.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Sims Pump Valve Co., Hoboken, N. J.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Rubber Co., New York, N. Y.
Zimmerman Packing Co., Cincinnati, O.

PACKING, RUBBER AND SYNTHETIC

American Felt Co., Glenville, Conn.
Anchor Packing Co., Philadelphia, Pa.
Armstrong Cork Co., Lancaster, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Chesterton Co., A. W., Everett, Mass.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Chicago Gasket Co., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Continental Rubber Wks., Erie, Pa.
Crane Packing Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y.
Dow Corning Corp., Midland, Mich.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gates Rubber Co., Denver, Colo.
General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Graton & Knight Co., Worcester, Mass.
Greene, Tweed & Co., North Wales, Pa.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins Inc., Stamford, Conn.
Houghton & Co., E. F., Philadelphia, Pa.
Johns-Manville, New York, N. Y.
Linear Incorporated, Philadelphia, Pa.
Minnesota Rubber & Gasket Co., Minneapolis, Minn.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Parker Appliance Co., The, Cleveland, O.
Products Research Co., Los Angeles, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Saran Lined Pipe Co., Ferndale, Mich.
Thermoid Co., Trenton, N. J.
United States Gasket Co., Camden, N. J.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
Xylos Rubber Co., Akron, O.
Zimmerman Packing Co., Cincinnati, O.

PAINT, HIGH TEMPERATURE, FOR HOT SURFACES

Allpax Co., Inc., Mamaroneck, N. Y.
Amercoat Corp., South Gate, Calif.
Babbitt Chemical Co., New Bedford, Mass.
Barreled Sunlight Paint Co., Providence, R. I. (high heat aluminum)
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Chemical Solvent Co., Birmingham, Ala.
Claronex Products, Inc., Brooklyn, N. Y.
Continental Products Co., Euclid, O.
Debevoise Co., The, Brooklyn, N. Y.
Dixon Crucible Co., Joseph, Jersey City, N. J.
du Pont de Nemours & Co., Inc., E. I., Finishes Div., Wilmington, Del.
Flexrock Co., Philadelphia, Pa.
Foster Co., Benjamin, Philadelphia, Pa.
General Paint Corp., San Francisco, Calif.
Illinois Bronze Powder Co., Chicago, Ill.
Kellog Co., M. W., The, New York, N. Y.
Koppers Company, Inc., Pittsburgh, Pa.
London Chemical Co., Melrose Park, Ill.
Midland Paint & Varnish Co., Cleveland, O.
Nebel Mfg. Co., Cleveland, O.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Quigley Co., New York, N. Y.
Randolph-Page, Inc., New York, N. Y. (for radiators)
S.O.S. Products Co., Inc., Brooklyn, N. Y.
Sandstrom Products Co., Port Byron, Ill.
Sherwin-Williams Co., The, Cleveland, O.
Steelcote Mfg. Co., St. Louis, Mo.
Thompson and Co., Oakmont, Pa.
Tropical Paint Co., Cleveland, O.
Truscon Laboratories, Detroit, Mich.
United Chromium Div., Metal & Thermit Corp., New York, N. Y.
Valdura Div., American-Marietta Co., Chicago, Ill.
Vimasco Corp., Charleston, W. Va.
Warren Refining & Chemical Co., The, Cleveland, O.
Wilbur & Williams Co., Brighton, Mass.

PANEL BOARDS

See Boards, Panel and Control

PANEL HEATING AND COOLING

See Coils and Panels, Radiant Heating and Cooling; Conductors and Panels, Electrical, for Radiant Heating

PANELS, PERFORATED, FOR AIR DIFFUSION

Diamond Mfg. Co., Wyoming, Pa.
Harrington & King Perforating Co., Chicago
Mahon Co., R. C., The, Detroit, Mich.
Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Simplex Ceiling Corp., New York, N. Y.
Wakefield Co., The, Vermillion, O.

PANELS, WINDOW, FOR AIR CONDITIONERS

Russell Co., F. C., The, Cleveland, Ohio

PARTS FOR HEATING AND AIR CONDITIONING EQUIPMENT

Ackermann Mfg. Co., Wheeling, W. Va.
Adams Co., The, Dubuque, Iowa
Air & Refrigeration Corp., New York, N. Y. (factory insulated panels)
Atlas Mfg. Co., St. Paul, Minn. (boiler jackets, furnace cabinets; air conditioning cabinets)
Berger Div., Republic Steel Corp., Canton, O. (cabinets, housings, canopies)
By-Buk Co., Los Angeles, Calif. (corner pads for under side of metal sheets)
Camloc Fastener Corp., New York, N. Y. (Fasteners for access panels and sheet metal)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Insulating panel for housing and duct construction)
Cincinnati Metalcrafts Inc., Cincinnati, O. (sheet metal fabricating)
Commercial Shearing & Stamping Co., Youngstown, O.
Detroit Stamping Co., Detroit, Mich.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y. (hardware and parts used in fabricating dampers and turning vanes)
Eaton Mfg. Co., Detroit, Mich. (gray iron castings for air conditioning equipment)
Falstrom Co., Passaic, N. J. (Air conditioning cabinets, steel control panels)
Federal-Mogul Corp., Detroit, Mich. (bushings, sleeves, ferrules)
General Tire & Rubber Co., Logansport, Ind. (Blower mounting)
Harrison Sheet Steel Co., Chicago, Ill. (covers for radiators)
Metalcraft Inc., Mason City, Ia. (name plates for equipment)
Mueller Brass Co., Port Huron, Mich. (Specially fabricated copper tubing, machine formed tubes)
National Lock Co., Inc., Rockford, Ill. (hinges, handles, latches, catches, supports, etc.)
Phoenix Products Co., Milwaukee, Wis. (metal spinnings for fan housings, diffusers, etc.)
Pittsfield Products, Inc., Ann Arbor, Mich. (perforated wire cloth parts)
Rigidized Metals Corp., Buffalo, N. Y. (rigidized metal)
South Chester Co., Southco Div., Lester, Pa. (blind rivets, panel fasteners, adjustable pawl fasteners, door retaining springs)
Speakman Co., Wilmington, Del. (machined parts)
Standard Pressed Steel Co., Jenkintown, Pa. (socket screws, spring pins)
Utica Products, Inc., Utica, N. Y.

PARTS, REFRIGERATING COMPRESSOR

Hunt Spiller Mfg. Corp., Boston, Mass.
Production Stamping Co., Omaha, Nebr.
Refrigeration Devices Co., Nutley, N. J. (oiler for refrigeration compressors)
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Shank Co., Cyrus, Chicago, Ill.
Voss Co., Inc., J. H. H., New York, N. Y.
York Corp., York, Pa.

PENETRANT, DYE, FOR NON-DESTRUCTIVE TESTING OF METAL
Turco Products, Inc., Los Angeles, Calif.

PENETRANT SOLVENT FOR LOOSENING THREADED JOINTS
See Solvent, Penetrant

pH INDICATORS
See Indicators, pH

PILLOW BLOCK BEARINGS
See Bearings, Pillow Block

PILOT LIGHTS
See Lights, Pilot and Signal

PILOTS, GAS, FOR OIL BURNERS
Eclipse Fuel Engineering Co., Rockford, Ill
Ransome Co., Emeryville, Calif.
White-Rodgers Electric Co., St. Louis, Mo.

PIPE, ALUMINUM
Aluminum Co. of America, Pittsburgh, Pa
Bridgeport Brass Co., Bridgeport, Conn
Central Steel & Wire Co., Chicago, Ill.
Kaiser Aluminum & Chemical Corp., Oakland, Calif.
Revere Copper & Brass, Inc., New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Youngstown Welding & Engineering, Youngstown, O.

PIPE, ASBESTOS FIBER AND CEMENT
Central Foundry Co., Newark, N. J.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa

PIPE BENDERS
See Benders, Pipe

PIPE BIT SETS
See sets, Pipe Bit

PIPE, BRASS AND COPPER
American Brass Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Gardiner Metal Co., Chicago, Ill.
Hussey & Co., C. G., Div. Copper Range Co., Pittsburgh, Pa.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Phelps Dodge Copper Products Corp., British American Tube Div., New York, N. Y.
Reading Tube Corp., New York, N. Y.
Revere Copper and Brass, Incorporated, New York, N. Y.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Detroit, Mich.

PIPE, CAST IRON, PRESSURE, BELL AND SPIGOT
Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Central Foundry Co., Newark, N. J.
Clow & Sons, James B., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Inner-Tite Div. of Yara Engineering Corp., Elizabeth, N. J.
Lynchburg Foundry Co., Lynchburg, Va.
McWane Cast Iron Pipe Co., Birmingham, Ala.
United States Pipe & Foundry Co., Birmingham, Ala.
Warren Foundry & Pipe Corp., New York, N. Y.

PIPE, CAST IRON, PRESSURE, FLANGED
Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, James B., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Lynchburg Foundry Co., Lynchburg, Va.
McWane Cast Iron Pipe Co., Birmingham, Ala.
United States Pipe & Foundry Co., Birmingham, Ala.
Warren Foundry & Pipe Corp., New York, N. Y.

PIPE, CAST IRON, THREADED
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, James B., Chicago, Ill.
McWane Cast Iron Pipe Co., Birmingham, Ala.
United States Pipe & Foundry Co., Birmingham, Ala.
Warren Foundry & Pipe Corp., New York, N. Y.

PIPE CLEANING COMPOUNDS
See Compounds, Cleaning, Pipe Coil and Condenser

PIPE CLEANING MACHINES
See Machines, Pipe Cleaning; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

PIPE COILS
See Coils, Pipe

PIPE COUPLINGS
See Couplings, Pipe

PIPE COVERING, ADHESIVES
See Adhesives, for Pipe Covering

PIPE CUTTERS
See Cutters

PIPE CUTTING MACHINES
See Machines, Pipe Cutting and Threading; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

PIPE EXTRACTORS
See Extractors, Pipe

PIPE, FIBER
Brown Co., Boston, Mass.
Central Foundry Co., Newark, N. J.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
Manufacturers Corp., Mansfield, O.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Richland Co., Mansfield, O.

PIPE, FINNED
California Steel Products Div., Richmond, Calif.
Drayer-Hanson, Inc., Subsidiary of National U. S. Radiator Corp., Los Angeles, Calif.
Edwards Engineering Corp., Pompton Plains, N. J.
Frick Co., Waynesboro, Pa. (square and spiral)
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
Sterling Radiator Co., Inc., Westfield, Mass.
Tenney Engineering, Inc., Union, N. J.

PIPE AND FITTINGS, GAS VENT AND FLUE
Acme Mfg. Co., Philadelphia, Pa.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Char-Gale Mfg. Co., Minneapolis, Minn.
Condensation Engineering Corp., Chicago, Ill.
Corbman Bros., Inc., Philadelphia, Pa.
Enderle, Inc., Ltd., Frank X., Los Angeles, Calif.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Harvey Aluminum, Torrance, Calif.
Howes-Woods Co., Cambridge, Mass.
Johns-Manville, New York, N. Y.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Metal Fabricators, Inc., Charlotte, N. C.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Robinson Clay Product Co., The, Akron, O.
Van-Packer Corp., Bettendorf, Ia.
Wallace Co., William, Metalbestos Div., Belmont, Calif.
Williamson Heater Co., Cincinnati, O.

PIPE FITTINGS
See Fittings, Pipe

PIPE, GLASS
Corning Glass Wks., Corning, N. Y.
Fischer & Porter Co., Hatboro, Pa.

PIPE HANGERS
See Hangers and Supports, Pipe

PIPE, HARD RUBBER
American Hard Rubber Co., New York, N. Y.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Goodrich Co., B. F., Akron, O.
Hewitt-Robins, Inc., Stamford, Conn.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Raybestos-Manhattan, Inc., Passaic, N. J. (Flexible)
United States Rubber Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J.

PIPE INSULATION ADHESIVES
See Adhesives, for Pipe Covering

PIPE, JACKETED
Carpenter Monolithic Floating Floor Co., Cleveland, O.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Flori Pipe Co., The, St. Louis, Mo.
Fluid Systems, Inc., New Haven, Conn.
Heat & Power Corp., Baltimore, Md.
Kaiser Co., E. B., Glenview, Ill.
Midwest Piping Co., Inc., St. Louis, Mo.
Nooter Corp., St. Louis, Mo.
Parks-Cramer Co., Fitchburg, Mass.
Pittsburgh Pipe Coil & Bending Co., Etna, Pa.
Red Jacket, Inc., Carnegie, Pa.
Ric-wiL, Inc., Barberton, O.
Roessing Mfg. Co., Pittsburgh, Pa.
Shaw-Kendall Engineering Co., Toledo, O.
Youngstown Welding & Engineering, Youngstown, O.

PIPE JOINT COMPOUNDS
See Cement and Compounds, Pipe Joint

PIPE LOCATORS
See Locators, Pipe, Underground

PIPE, LINED
American Brass Co., Waterbury, Conn. (Tin)
American Cast Iron Pipe Co., Birmingham, Ala. (Cement)
American Hard Rubber Co., New York, N. Y. (Rubber)
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Barrows Porcelain Enamel Corp., Cincinnati, O. (glass, ceramic-coated)
Bart Mfg. Corp., Belleville, N. J.
Cement Lined Pipe Co., Lynn, Mass. (Cement)
Chemical Coatings & Engineering Co., Edgemont, Pa.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Gates Engineering Co., Wilmington, Del.
Goodrich Co., B. F., Akron, O. (Rubber-lined)
Heil Process Equipment Corp., Cleveland, O.
Heresite & Chemical Co., Manitowoc, Wis. (Phenolic and rubber coatings)
Hill, Hubbell & Co., Cleveland, O.
Jones & Laughlin Steel Corp., Pittsburgh, Pa. (Cement)
Kaiser Co., E. B., Glenview, Ill.
Knapp Mills, Inc., Long Island City, N. Y.
Knight, Maurice A., Akron, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin lined)
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Michigan Pipe Co., Gagetown, Mich. (Wood, saran rubber)
National Lead Co., New York, N. Y. (Lead)
Nooter Corp., St. Louis, Mo.
Raybestos-Manhattan, Inc., Passiac, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (Lead)
Saran Lined Pipe Co., Ferndale, Mich.
United States Rubber Co., New York, N. Y. (Rubber)

United States Stoneware Co., New York.
Warren Foundry & Pipe Corp., New York. N. Y. (Cement)
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, NICKEL AND NICKEL ALLOY

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Biggs Boiler Works Co., The, E. Akron, O.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Electric Steel Foundry Co., Portland, Ore.
Globe Steel Tubes Co., Milwaukee, Wis.
International Nickel Co., Inc., The, New York, N. Y.
Revere Copper and Brass, Incorporated, New York, N. Y.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering, Youngstown, O.

PIPE, NICKEL PLATED

Alco Products, Inc., Schenectady, N. Y.
Bart Mfg. Co., Belleville, N. J.
Irvington Varnish & Insulator, Div. of Minn. Mining & Mfg. Co., Irvington, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.

PIPE, PLASTIC

Alpha Plastics, Inc., W. Orange, N. J. (PVC, rigid)
American Agile Corp., Bedford, O.
American Hard Rubber Co., New York, N. Y.
Anesite Co., Chicago, Ill. (polyethylene, butyrate)
Associated Plastic Co's., Inc., Midland, Mich. (rigid polyvinyl)
Atlas Mineral Products Co., Mertztown, Pa. (rigid polyvinyl chloride for service up to 150 F)
Carlon Products Corp., Cleveland, O.
Chesflex Corp., Yonkers, N. Y. (polyethylene, flexible)
Colonial Plastics Mfg. Co., Cleveland, O. (Rigid PVC 40 - 160 F pressures function of size, wall thickness and Temp.)
Commercial Plastics Co., Chicago, Ill.
Continental Can Co., Millsplastic Pipe Div., New York, N. Y.
Corite Products, Inc., Chicago, Ill. (rigid fiberglas, reinforced polyester)
Continental-Diamond Fibre, Newark, Del.
Crane Co., Chicago, Ill.
Crescent Plastics, Inc., Evansville, Ind. (flexible, semi-rigid)
Dow Chemical Co., Midland, Mich. (saran-lined pipe, iron or steel and saran pipe)
Duriron Co., Inc., The, Dayton, O.
DuVerre, Inc., Hamburg, N. Y.
Easton Plastic Products Co., Easton, Pa. (rigid-unplasticized polyvinyl chloride)
Fibercast Corp., Sand Spring, Okla.
Franklin Plastics, Inc., Franklin, Pa. (polyethylene)
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hartwell & Son, Inc., H. N., Boston, Mass. (rigid PVC)
Haveg Corp., Newark, Del. (Resin-asbestos, polyester glass & polyvinyl chloride)
Heil Process Equipment Corp., Cleveland, O.
Irvington Varnish & Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J. (flexible)
Johnson Plastic Corp., Chagrin Falls, O. (polyethylene, tenite & kralastic)
Knight, Maurice A., Akron, O. (rigid, glass cloth reinforced resin 280 F)
Kraloy Plastic Pipe Co., Inc., Los Angeles, Calif.
Manufacturers Corp., Mansfield, O.
Michigan Plastic Pipe Co., Detroit, Mich.
Mueller Brass Co., Port Huron, Mich. (Non-rigid temp. range up to 140 F)
Munray Products, Inc., Cleveland, O. (polyethylene, flexible)
Naugatuck Chemical Div., United States Rubber Co., Naugatuck, Conn.
National Tube Div., United States Steel Corp., Pittsburgh, Pa. (flexible polyethylene)
Plastex Corp., Columbus, O.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.
Polymer Corp. of Pa., The, Reading, Pa. (rigid, nylon)
Reflin Co., San Diego, Calif. (rigid, reinforced with glass fibers)
Republic Steel Corp., Cleveland, O.
Richland Co., Mansfield, O.
Saran Lined Pipe Co., Ferndale, Mich.
Seelye Craftsman, Minneapolis, Minn.
Skyline Industries, Titusville, Pa. (rigid and flexible)
Southwestern Plastic Pipe Co., Mineral Wells, Tex.
Texas Vitrified Pipe Co., Mineral Wells, Tex. (polyethylene-rigid PVC)
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (flexible, semi-rigid high impact & rigid PVC)
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York.
Vanton Pump & Equipment Corp., Hillside, N. J. (Buna and styrene-buna N)
Walworth Co., New York, N. Y.
Western Plastics Corp., Tacoma, Wash. polyethylene & kralastic)
Wilmington Plastics Co., Wilmington, Del. (PVC rigid)
Yardley Plastics Co., Columbus, O. (rigid and non-rigid O F - 125 F)

PIPE PLUGS

See Plugs, Pipe

PIPE, PRE-INSULATED

Beltran Associates, Inc., Brooklyn, N. Y.
Durant Insulated Pipe Co., Palo Alto, Calif.
Durant International Corp., Williamstown, N. J.
Flexible Tubing Corp., Guilford, Conn.
Heat Transmission Conduit Co., Cleveland, O.
Kaiser Co., E. B., Glenview, Ill.
Ric-wiL., Inc., Barberton, O.

PIPE REAMERS

See Reamers, Pipe

PIPE REPAIR CLAMPS

See Clamps, Pipe Repair

PIPE, SPIRAL, RIVETED AND WELDED

Armco Drainage & Metal Products, Inc., Middletown, O.
Biggs Boiler Wks., Co., The, E. Akron, O.
Naylor Pipe Co., Chicago, Ill.
Nikoh Tube Co., Chicago, Ill.
Taylor Forge & Pipe Wks., Chicago, Ill.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

PIPE, STEAM TRACED

Aluminum Co. of America, Pittsburgh, Pa.

PIPE, STEEL, ALLOY

Alco Products, Inc., Schenectady, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Globe Steel Tubes Co., Milwaukee, Wis.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Taylor Forge & Pipe Wks., Chicago, Ill.
Trent Tube Co., East Troy, Wis.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.
Youngstown Welding & Engineering, Youngstown, O.

PIPE, STEEL, BUTT AND LAP WELDED

Bethlehem Steel Co., Bethlehem, Pa.
Biggs Boiler Works Co., The, E. Akron, O. (large diameter)
Byers Co., A. M., Pittsburgh, Pa.
Central Steel & Wire Co., Chicago, Ill.
Chicago Metal Mfg. Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Fretz-Moon Tube Co., Butler, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Laclede Steel Co., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y. (Specially fabricated)
Smith Corp., A. O., Milwaukee, Wis.
South Chester Tube Co., Chester, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Wheatland Tube Co., Philadelphia, Pa.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, STEEL, SEAMLESS

Alco Products, Inc., Schenectady, N. Y.
Bart Mfg. Co., Belleville, N. J. (nickel coated)
Globe Steel Tubes Co., Milwaukee, Wis.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Mesta Machine Co., Pittsburgh, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Timken Roller Bearing Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, STEEL, STAINLESS

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
Electric Steel Foundry Co., Portland, Ore.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Globe Steel Tubes Co., Milwaukee, Wis.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Pypon Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Republic Steel Corp., Steel and Tubes Div., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Stainless Welded Products, Inc., Clifton, N. J.
Standard Tube Co., Detroit, Mich.
Timken Roller Bearing Co., Canton, O.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering, Youngstown, O.

PIPE, STONEWARE

General Ceramics Corp., Keasbey, N. J.
Knight, Maurice A., Akron, O. (acid proof)
United States Stoneware Co., Plastics & Synthetics Div., Akron, O. (also porcelain)
United States Stoneware Co., New York, N. Y.

PIPE SUPPORTS

See Hangers and Supports, Pipe

PIPE SURFACE, THERMOMETERS

See Thermometers, Indicating, Pipe Surface

PIPE, TIN

Alpha Metals, Inc., Brooklyn, N. Y.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Henry Furnace Co., Medina, O.
National Lead Co., New York, N. Y.
Northwest Lead Co., Seattle, Wash.
Standard Rolling Mills, Inc., Brooklyn, N. Y.

PIPE TONGS
See Tongs, Pipe

PIPE, TUBING, FITTINGS AND VALVES, CARBON AND GRAPHITE
General Ceramics Corp., Keasbey, N. J.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.

PIPE AND TUBING, LEAD AND LEAD ALLOY
Alpha Metals, Inc., Brooklyn, N. Y.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Gardiner Metal Co., Chicago, Ill.
National Lead Co., New York, N. Y.
Northwest Lead Co., Seattle, Wash.
Rochester Lead Works, Inc., Rochester, N. Y.
Standard Rolling Mills, Inc., Brooklyn, N. Y.
United States Stoneware Co., New York, N. Y.

PIPE, VITRIFIED CLAY
Bowerston Shale Co., The, Bowerston, O.
General Ceramics Corp., Keasbey, N. J.
Heat Transmission Conduit Co., Cleveland, O.
Robinson Clay Product Co., The, Akron, O.
Stillwater Clay Products Co., The, Cleveland, O.
Superior Clay Corp., The, Uhrichsville, O.
Texas Vitrified Pipe Co., Mineral Wells, Tex.

PIPE, WOOD
Caldwell Co., W. E., Louisville, Ky.
Michigan Pipe Co., Gagetown, Mich.
Sante Fe Tank & Tower Co., Los Angeles.

PIPE WRENCHES
See Wrenches, Pipe

PIPE, WROUGHT IRON
Byers Co., A. M., Pittsburgh, Pa.

PIPING, FABRICATED
See Bends, Expansion, Steam Pipe; Headers, Pipe, Welded; Coils, Pipe

PIPING IDENTIFICATON MARKERS
See Identification Markers for Piping Services

PISTON RINGS
See Rings, Piston

PITOT TUBES
See Tubes, Pitot

PITTSBURGH LOCK FORMING MACHINES
See Machines, Pittsburgh Lock Forming

PLASTIC PIPE AND PIPE FITTINGS
See Pipe, Plastic; Fittings, Pipe, Plastic

PLASTIC PIPE AND SHEET WELDERS
See Welders, for Plastic Pipe or Plastic Sheet

PLASTIC SHEETS FOR DUCTS AND HOODS
See Sheets, Plastic for Ducts and Hoods

PLASTIC TUBING
See Tubing, Plastic

PLASTICS, POWDERS AND RESINS (BASIC MATERIALS)
Bakelite Co., Div. of Union Carbide & Carbon Chemical Corp., New York, N. Y.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Dow Chemical Co., The, Midland, Mich.
Dow Corning Co., Midland, Mich.
duPont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del. (nylon, polyethylene, tetrafluoroethylene & acrylic resins)
Durez Plastics Div., Hooker Electrochemical Co., North Tonawanda, N. Y.
Firestone Plastics Co., Pottstown, Pa.
General Electric Co., Chemical & Metallurgical Div., Pittsfield, Mass. (alkyd, glyptal, phenolic, permafil and polyester resins)
General Tire & Rubber Co., Akron, O.
Goodrich Chemical Co., B. F., Cleveland, O.
Hooker Electrochemical Co., Niagara Falls, N. Y.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Polymer Corp. of Pa., The, Reading, Pa.
Tenite Plastics Div., Eastman Chemical Products, Inc., Kingsport, Tenn. (acetate, butyrate, polyethylene)

PLATES, FLOOR AND CEILING
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Eastern Stainless Steel Corp., Baltimore, Md.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
G & H Mfg. Co., Philadelphia, Pa.
Grinnell Co., Providence, R. I.
Hupp Corp., Globe Stamping Div., Cleveland, O.
Keeney Mfg. Co., Newington, Conn.
Little Mfg. Co., M. S., Hartford, Conn.
New York Air Valve Corp., Brooklyn, N. Y.
Pipe Plugs, Inc., Wellington, O.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
U. S. Plug & Fitting Co., Wellington, O.
Walworth Co., New York, N. Y.
Zurn Mfg. Co., J. A., Erie, Pa.

PLUG COCKS
See Valves, Plug

PLUG VALVES
See Valves, Plug

PLUGS, FUSIBLE, BOILER
Allen Mfg. Co., W. D., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Chiksan Co., Brea, Calif.
Division Lead Co., Summit, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Mueller Brass Co., Port Huron, Mich.
Powell Co., Wm., The, Cincinnati, O.
Swift Lubricator Co., Inc., Elmira, N. Y.

PLUGS, PIPE, MAGNETIC, FOR REMOVING FERROUS PARTICLES
U. S. Plug & Fitting Co., Wellington, O.

PLUGS, REPAIR, FOR PIPE
Adams Pipe Repair Products, El Monte, Calif.
Allen Mfg. Co., W. D., Chicago, Ill.
Kuhns Bros. Co., Dayton, O.
Lamerson & Sessions Co., The, Cleveland, O.
Parker-Kalon Div., Gen. Am. Trans. Corp., Clifton, N. J.
Protective Closures Co., Buffalo, N. J.
Scharer & Co., Ray A., Detroit 2, Mich.

PLUGS, REPAIR, FOR TANKS
Adams Pipe Repair Products, El Monte, Calif.
Chicago Specialty Mfg. Co., Chicago, Ill.
Kenney Co., L. C., Chicago, Ill.
Parker-Kalon Div., Gen. Am. Trans. Corp., Clifton, N. J.
Pipe Plugs, Inc., Wellington, O.
Standard Pressed Steel Co., Jenkintown, Pa.
U. S. Plug & Fitting Co., Wellington, O.

PLUGS, TUBING TEST
Chicago Specialty Mfg. Co., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.

PORTS, OBSERVATION, BOILER
Bigelow Liptak Corp., Detroit, Mich.
Detroit Stoker Co., Detroit, Mich.
Ess Instrument Co., Bergenfield, N. J.
Green Fire Brick Co., Mexico, Mo.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Plibrico Co., Chicago, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reintjes Co., Geo. P., Kansas City, Mo.
Springfield Boiler Co., Springfield, Ill.

POSITIONERS, WELDING
Johnson Machine Works, Eau Claire, Wis.
National Cylinder Gas Co., Chicago, Ill.
Sight Feed Generator Co., West Alexandria, O.
Webb Corp., The, Webb City, Mo.
Weldit, Inc., Detroit, Mich.

POWER FACTOR CORRECTION
See Capacitors

POWER SHEARS
See Shears, Power

PREHEATERS, FUEL OIL
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Andale Co., Philadelphia, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., The, Elyria, O.
Buxton Mfg. Co., Dover, N. J.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crotty Mfg. Co., Flushing, L. I., N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drying Systems, Inc., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Electro-Therm, Inc., Silver Spring, Md.
Engineer Co., New York, N. Y.
Falcon Equipment Co., New Brighton, Pa.
Fluid Systems, Inc., New Haven, Conn.
General Fittings Co., East Greenwich, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Griscom-Russell Co., Massillon, O.
Hauck Mfg. Co., Brooklyn, N. Y.
Heatron, Inc., York, Pa.
Heatube Corp., Allegan, Mich.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo. (Electric)
Johnson Corp., The, Three Rivers, Mich.
Kaiser Co., E. B., Glenview, Ill.
Kewanee-Ross Corp., Kewanee, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Leahy Mfg. Co., Los Angeles, Calif.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Lientz Co., B. P., Kansas City, Mo.
Manning & Lewis Engineering Co., Newark, N. J.
National Airoil Burner Co., Inc., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Peabody Engineering Corp., New York, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Rempe Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Sims Co., Erie, Pa.
Staples & Pfeiffer, San Francisco, Calif.
Superior Combustion Industries, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Tranter Mfg., Inc., Lansing, Mich.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Whitlock Mfg. Co., Hartford, Conn.
Wiegand Co., Edwin L., Pittsburgh, Pa. (Electric)
Yula Water Heaters, Inc., Bronx, N. Y.

PREHEATERS AND STRESS RELIEVERS, ELECTRIC, FOR PIPE WELDS
Electric Arc, Inc., Newark, N. J.
Falcon Equipment Co., New Brighton, Pa.
Heatube Corp., Allegan, Mich.
Martin-Quaid Co., Philadelphia, Pa.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wiegand Co., Edwin L., Pittsburgh, Pa.

PRE-INSULATED PIPE
See Pipe, Pre-Insulated

PRESSURE BLOWERS
See Blowers, High Pressure

PRESSURE CONTROLLERS
See Regulators, Pressure

PRESSURE GAGES
See Gages, Indicating, Pressure

PRESSURE INDICATOR-CONTROLLERS
See Indicator-Controllers, Pressure

PRESSURE RECORDER-CONTROLLERS
See Recorder-Controllers, Pressure

PRESSURE RECORDERS
See Recorders, Pressure and Vacuum

PRESSURE REDUCING VALVES
See Valves, Pressure Reducing and Regulating

PRESSURE REGULATING VALVES
See Valves, Pressure Reducing and Regulating

PRESSURE REGULATORS
See Regulators, Pressure

PRESSURE SWITCHES
See Switches, Pressure and Vacuum

PROCESS HEATING SYSTEMS
See Systems, Process Heating, High Temperature

PROCESS STEAM SUPERHEATERS
See Superheaters, Process Steam

PROCESS AND STORAGE TANKS
See Tanks, Process and Storage

PROPANE VAPORIZERS
See Vaporizers

PROPELLER FANS
See Fans, Propeller

PROPELLER PUMPS
See Pumps, Propeller

PROPORTIONING PUMPS
See Pumps, Proportioning

PROTECTIVE COATINGS
See Coatings, Protective, for Metals

PROTECTORS, GAGE GLASS
Ernst Water Column & Gauge Co., Livingston, N. J.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Wright-Austin Co., Detroit, Mich.

PROTECTORS, PIPE COVERING
Baldwin-Hill Co., Trenton, N. J.
Bigelow-Liptak Corp., Detroit, Mich.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Carpenter & Paterson, Inc., Cambridge, Mass.
Childers Mfg. Co., Houston, Tex.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Grant Wilson Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Keystone Asphalt Products Co., Chicago, Ill.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Poe Co., C. W., The, Cleveland, O. (Alum jacketing)
Reynolds Metals Co., Louisville, Ky.
Smith Products Co., Northville, Mich.
Weston Electric Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

PSYCHROMETERS, MOTOR ASPIRATED
Abbeon Supply Co., Jamaica, N. Y.
Bahnson Co., Winston-Salem, N. C.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Scientific Instrument Co., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

PSYCHROMETERS, SLING AND HAND ASPIRATED
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Moistening Co., Providence, R. I.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
General Scientific Equipment Co., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Parks-Cramer Co., Fitchburg, Mass.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

PSYCHROSTATS
See Humidistats

PULLEYS AND SHEAVES, FOR BELT DRIVES
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass. (taper bushing)
Browning Mfg. Co., Maysville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago, Ill. (V belt)
Chicago Die Casting Mfg. Co., Chicago, Ill. (v-type and flat type)
Climax Metal Products Co., Cleveland, O. (v-belt and variable pitch)
Congress Drives Div., Tann Corp., Detroit, Mich. (V belt—fractional and multiple horsepower, and variable pitch)
Dayton Rubber Co., Dayton, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn. (V-Belt)
Duro Metal Products Co., Chicago, Ill. (steel & diecast)
Equipment Engineering Co., Minneapolis, Minn. (variable pitch)
Ft. Worth Steel & Machinery Co., Ft. Worth, Texas
Gates Rubber Co., The, Denver, Colo.
Goldens' Foundry & Machine Co., Columbus, Ga. (Cast iron)
Hewitt-Robins, Inc., Stamford, Conn. (Tapered cone, conveyor, flanged, grooved for round or V-Belt, iron, loose, motor, power transmission)
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill. (flat)
Lau Blower Co., Dayton, O.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Maurey Mfg. Corp., Chicago, Ill. (v-belt steel and cast iron)
Mercury Clutch Div., Automatic Steel Products, Inc., Canton, O.
Pyott Foundry & Machine Co., Chicago, Ill.
Reeves Pully Co., Columbus, Ind. (variable speed)
Speed Selector Inc., Cleveland, O. (variable pitch)
Sprout-Waldron & Co., Muncy, Pa.
Utility Fan Corp., Los Angeles, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J. (v-type)
Zatko Metal Products Co., Euclid, O.

PULVERIZED COAL BURNERS
See Burners, Pulverized Coal

PUMP BASES
See Bases and Pads, Vibration Isolating

PUMP-MOTOR UNITS, SELF-CONTAINED
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Chempump Corp., Philadelphia, Pa.
Cooper Alloy Corp., Hillside, N. J.
Gould Pumps, Inc., Seneca Falls, N. Y.
Jabsco Pump Co., Burbank, Calif.
Nash Engineering Co., South Norwalk, Conn.
Ingersoll-Rand Co., New York, N. Y.
Ruthman Machinery Co., Cincinnati, O.
Sta-Rite Products, Inc., Delavan, Wis.
Uniflow Mfg. Co., Erie, Pa.
Webster Electric Co., Racine, N. Y.
Weinman Pump Mfg. Co., The, Columbus, O.

PUMP UNITS, FUEL OIL
See Units, Fuel Oil, Heating, Pumping and Straining

PUMP VALVES
See Valves, Pump

PUMPS, BOILER FEED
Aldrich Pump Co., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Buffalo Pumps Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Div., Borg-Warner Corp., Los Angeles, Calif.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Clayton Mfg. Co., El Monte, Calif.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks., Co., Columbus, O.
Cyclotherm Div., National-U. S. Radiator Corp., Oswego, N. Y.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Dearborn Chemical Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham Co., C. A., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Corp., The, Three Rivers, Mich.
Johnston Pump Co., Pasadena, Calif.
Kingsford Foundry & Machine Wks., Oswego, N. Y.

Kisco Boiler & Engineering Co., St. Louis, Mo.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Lawrence Pump & Engine Co., Lawrence, Mass.
Lecourtenay Co., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
McDonnell & Miller, Inc., Chicago, Ill.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Nash Engineering Co., South Norwalk, Conn.
National Steam Pump Co., Upper Sandusky, O.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Injector Co., Div. of Buffalo · Eclipse Corp., Detroit, Mich.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Philadelphia Pump & Machinery Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York.
Robbins & Myers, Inc., Springfield, O.
Roth Co., Roy E., Rock Island, Ill.
Schaub Engineering Co., Fred H., Chicago, Ill.
Skidmore Corp., St. Joseph, Mich.
Sta-Rite Products, Inc., Delavan, Wis.
Sterling, Inc., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Swaby Mfg. Co., Chicago, Ill.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CENTRIFUGAL

Advance Pump Co., Berkeley, Calif.
Alliance Industries, Huntingden Valley, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Well Wks., Aurora, Ill.
Aurora Pump Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Barrett, Haentjens & Co., Hazleton, Pa.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Bell & Gossett Co., Morton Grove, Ill.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Div., Borg-Warner Corp., Los Angeles, Calif.
Carver Pump Co., Muscatine, Ia.
Chain Belt Co., Milwaukee, Wis.
Chempump Corp., Philadelphia, Pa. (magnetically driven)
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dayton Electric Mfg. Co., Chicago, Ill.
Dayton Pump & Mfg. Co., Dayton, O.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Dearborn Chemical Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
DeLaval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham Co., C. A., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eco Engineering Co., Newark 1, N. J.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Essick Mfg. Co., Los Angeles, Calif.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Foster Pump Works, Inc., Brooklyn, N. Y.
Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Frederick Iron & Steel Inc., Frederick, Md.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Gardner-Denver Co., Quincy, Ill.
Gen-A-Matic Corp., Van Nuys, Calif.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware, porcelain and graphite)
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Goodfellow Co., Inc., F. D., Memphis, Tenn.
Gorman-Rupp Industries, Inc., Belleville, O.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Granberg Corp., Oakland, Calif.
Industrial Filter & Pump Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
La Bour Co., Inc., The, Elkhart, Ind.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pump Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead lined and all lead)
Lecourtenay Co., Newark, N. J.
Leyman Mfg. Corp., John H., McGowan Co Div., Cincinnati, O.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Marlow Pumps, Division of Bell & Gossett Co., Ridgewood, N. J.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Memphis Pump & Mfg. Co., Memphis, Tenn.
Myers & Bro. Co., F. E., The, Ashland, O
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National Lead Co., New York, N. Y.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless of America, Inc., Chicago, Ill.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Radiant Utilities Corp., Brooklyn, N. Y.
Red Jacket Co., Inc., Carnegie, Pa.
Ruthman Machinery Co., Cincinnati, O.
Saran Lined Pipe Co., Ferndale, Mich. (Saran Lined)
Schneible Co., Claude B., Detroit, Mich.
Skidmore Corp., St. Joseph, Mich.
Smith Corp., A. O., Milwaukee, Wis.
Standard Electric Mfg. Co., West Berlin, N. J.
Sta-Rite Products, Inc., Delavan, Wis.
Sterling, Inc., Milwaukee, Wis.
Swaby Mfg. Co., Chicago, Ill.
Taber Pump Co., Buffalo, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Tech-Tron Corp., Lawrence, Kans.
Trane Co., The, LaCrosse, Wis.
Union Steam Pump Co., Battle Creek, Mich.
Universal Mfg. Co., Berkeley, Calif.
Utility Appliance Corp., Los Angeles, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Whitewater Pump Co., Inc., Whitewater, Wis.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CONDENSATE, FOR REMOVING CONDENSATION FROM AIR CONDITIONING UNITS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Ashcraft Co., J. P., Dallas, Tex.
Beach-Russ Co., New York, N. Y.
Berkeley Pump Co., Berkeley, Calif.
Davidson Co., M. T., New York, N. Y.
Deming Co., Salem, O.
Economy Pumps, Inc., Div. of C. H. Wheeler Mfg. Co., Philadelphia, Pa.
Egan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries, Inc., Hamden, Conn.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Hy-Lo Burner Co., Inc., Eddington, Pa.
Johnson Pump Co., Pasadena, Calif.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Nash Engineering Co., South Norwalk, Conn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless of America, Inc., Chicago, Ill.
Peerless Pump Div., Food Machinery & Chem. Corp., Los Angeles, Calif.
Tech-Tron Corp., Lawrence, Ks.
Warren Steam Pump Co., Inc., Warren, Mass.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

PUMPS, CONDENSATION RETURN

Advance Pump Co., Berkeley, Calif.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Barnes & Jones, Inc., Boston, Mass.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Div., Borg-Warner Corp., Los Angeles, Calif.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Cochrane Corp., Philadelphia, Pa.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Decatur Pump Co., Decatur, Ill.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham Co., C. A., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries, Inc., Hamden, Conn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Faber Engineering Co., Inc., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Healey Co., Lee, Glendale, Calif.
Heating Assurance, Inc., Spokane, Wash.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Corp., The, Three Rivers, Mich.
Johnston Pump Co., Pasadena, Calif.
Kisco Boiler & Engineering Co., St. Louis.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Lawrence Pump & Engine Co., Lawrence, Mass.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
Nash Engineering Co., South Norwalk, Conn.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Roth Co., Roy E., Rock Island, Ill.
Sarco Co., Inc., New York, N. Y.
Schaub Engineering Co., Fred H., Chicago.
Sellers Engineering Co., Chicago, Ill.
Skidmore Corp., St. Joseph, Mo.
Sta-Rite Products, Inc., Delavan, Wis.
Sterling, Inc., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Swaby Mfg. Co., Chicago, Ill.
Trane Co., The, LaCrosse, Wis.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CONTROLLED VOLUME

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Hills-McCanna Co., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.

PUMPS, DEEP WELL, TURBINE

American Well Wks., Aurora, Ill.
Aurora Pump Co., Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Byron Jackson Div., Borg-Warner Corp., Los Angeles, Calif.
Davidson Co., M. T., New York, N. Y.
Decatur Pump Co., Decatur, Ill. (shallow well)
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Pump Co., Pasadena, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Layne & Bowler, Inc., Memphis, Tenn.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Smith Corp., A. O., Milwaukee, Wis.
Sta-Rite Products, Inc., Delavan, Wis.
Universal Mfg. Co., Berkeley, Calif.
Worthington Corp., Harrison, N. J.

PUMPS, EVAPORATIVE COOLER

Berkeley Pump Co., Berkeley, Calif.
Chempump Corp., Philadelphia, Pa.
Deming Co., Salem, O.
Essick Mfg. Co., Los Angeles, Calif.
Goulds Pumps, Inc., Seneca, N. Y.
Ingersoll-Rand Co., New York, N. Y.
International Metal Products, Phoenix, Ariz.
Jabsco Pump Co., Burbank, Calif.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Myers & Bro. Co., F. E., The. Ashland, O.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Ruthman Machinery Co., Cincinnati, O.
Taco Heaters, Inc., Cranston, R. I.
Tech-Tron Corp., Lawrence, Ks.
Warren Steam Pump Co., Inc., Warren, Mass.
Weinman Pump Mfg. Co., The, Columbus, O.
Wright Mfg. Co., Phoenix, Ariz.

PUMPS, FIRE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Davidson Co., M. T., New York, N. Y.
De Laval Steam Turbine Co., Trenton, N. J.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gorman-Rupp Industries, Inc., Belleville, O.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Layne & Bowler, Inc., Memphis, Tenn.
Lecourtenay Co., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Marlow Pumps, Division of Bell & Gossett Co., Ridgewood, N. J.
Myers & Bro. Co., F. E., The, Ashland, O.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Solar Aircraft Co., San Diego, Calif. (gas turbine)
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Worthington Corp., Harrison, N. J.

PUMPS, GEAR

American Hard Rubber Co., New York, N. Y.
Granberg Corp., Oakland, Calif.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Philadelphia Gear Works, Inc., Philadelphia.
Roper Corp., Geo. D., Rockford, Ill.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Webster Electric Co., Racine, Wis.
Worthington Corp., Harrison, N. J.

PUMPS, HIGH PRESSURE, HYDRAULIC

Aldrich Pump Co., Allentown, Pa.
American Engineering Co., Philadelphia, Pa.
American Instrument Co., Inc., Silver Spring, Md.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Blackhawk Mfg. Co., Milwaukee, Wis.
Byron Jackson Div., Borg-Warner Corp., Los Angeles, Calif.
C C Pump Mfg. Div., Palmyra, N. J.
Carpenter Valve Corp., The, Cleveland, O.
Coffin Co., J. S., Jr., Englewood, N. J.
Commercial Shearing & Stamping Co., Youngstown, O.
Davidson Co., M. T., New York, N. Y.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Gorman-Rupp Industries, Inc., Belleville, O.
Gray Co., Inc., Minneapolis, Minn.
Hydreco Div., New York Air Brake Co., Cleveland, O.
Kobe Inc., Huntington Park, Calif.
Ledeen Mfg. Co., Los Angeles, Calif.
Milton Roy Co., Philadelphia, Pa.
Myers & Bro., Co., F. E. The, Ashland, O.
National Steam Pump Co., Upper Sandusky, O.
Nye Tool Co., Chicago, Ill.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Robbins & Myers, Inc., Springfield, O.
Roper Corp., Geo. D., Rockford, Ill.
Royalton Co., Inc., Gasport, N. Y.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Texsteam Corp., Houston, Tex.
Tuthill Pump Co., Chicago, Ill.
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Weinman Pump Mfg. Co., The, Columbus, O.
Wilson Co., K. R., Arcade, N. Y.
Worthington Corp., Harrison, N. J.

PUMPS, HYDROSTATIC TEST, HAND-OPERATED

Deming Co., Salem, O.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Pacific Pumping Co., Oakland, Calif.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

PUMPS, JET

Advance Pump Co., Berkeley, Calif.
Aurora Pump Co., Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Modern Woodmanse Sales Div., George Goetz Corp., West Chicago, Ill.
Myers & Bro. Co., F. E., The, Ashland, O.
Pacific Pumping Co., Oakland, Calif.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Sta-Rite Products, Inc., Delavan, Wis.
Uniflow Mfg. Co., Erie, Pa.
Whitewater Pump Co., Inc., Whitewater, Wis.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

PUMPS, LIQUID REFRIGERANT CIRCULATING

Alliance Industries, Huntingden Valley, Pa.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Byron Jackson Div., Borg-Warner Corp., Los Angeles, Calif.
Chempump Corp., Philadelphia, Pa.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Corley Co., Inc., The, Jersey City, N. J.
De Laval Steam Turbine Co., Trenton, N. J.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Heatron, Inc., York, Pa.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Roper Corp., Geo. D., Rockford, Ill.
Roth Co., Roy E., Rock Island, Ill.
Viking Pump Co., Cedar Falls, Ia.
Vilter Mfg. Co., Milwaukee, Wis.
Warren Steam Pump Co., Inc., Warren, Mass.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

PUMPS, PROPELLER

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Well Works, Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Byron Jackson Div., Borg-Warner Corp., Los Angeles, Calif.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Haertel Co., Walter, Minneapolis, Minn.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lawrence Pumps, Inc., Lawrence, Mass.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Ruthman Machinery Co., Cincinnati, O.
Warren Steam Pump Co., Inc., Warren, Mass.
Worthington Corp., Harrison, N. J.

PUMPS, PROPORTIONING

American Instrument Co., Inc., Silver Spring, Md.
Bird-Archer Co., Philadelphia, Pa.
Bruner Corp., Milwaukee, Wis.
C C Pump Mfg. Div., Palmyra, N. J.
Cochrane Corp., Philadelphia, Pa.
Dearborn Chemical Co., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Jacuzzi Bros., Inc., Richmond, Calif.
Madden Corp., The, Chicago, Ill.
Marco Co., Inc., Saginaw, Mich.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Philadelphia Pump and Machinery Co., Inc., Philadelphia, Pa.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Robbins & Myers, Inc., Springfield, O.
Texsteam Corp., Houston, Tex.
Vanton Pump & Equipment Corp., Hillside, N. J.
Wallace & Tiernan Inc., Belleville, N. J.

PUMPS, RECIPROCATING

Aldrich Pump Co., Allentown, Pa.
American Hard Rubber Co., New York, N. Y. (Rubber and Rubber lined)
American-Marsh Pumps, Inc., Battle Creek, Mich.
Barnes Mfg. Co., Mansfield, O.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.

Columbus Steam Pump Wks., Co., Columbus, O.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dearborn Chemical Co., Chicago, Ill.
Deming Co., Salem, O.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Duro Co., Dayton, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Gardner-Denver Co., Quincy, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Gray Company, Inc., Minneapolis, Minn.
Healey Co., Lee, Glendale, Calif.
Hills-McCanna Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Ledeen Mfg. Co., Los Angeles, Calif.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milton Roy Co., Philadelphia, Pa.
Modern Woodmanse Sales Div., George Goetz Corp., W. Chicago, Ill.
Myers & Bro. Co., F. E., The, Ashland, O.
National Steam Pump Co., Upper Sandusky, O.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Royalton Co., Inc., Gasport, N. Y.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Uniflow Mfg. Co., Erie, Pa.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Whitewater Pump Co., Inc., Whitewater, Wis.
Worthington Corp., Harrison, N. J.

PUMPS, ROTARY

American Engineering Co., Philadelphia, Pa.
American Hard Rubber Co., New York, N. Y. (Rubber and rubber lined)
Beach-Russ Co., New York, N. Y.
Blackmer Pump Co., Grand Rapids, Mich.
Bump Pump Co., La Crosse, Wis.
Chicago Pneumatic Tool Co., New York.
Cooper Alloy Corp., Hillside, N. J.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Duriron Co., Inc., The, Dayton, O. (Acid resisting)
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eco Engineering Co., Newark, N. J.
Fairbanks, Morse & Co., Chicago, Ill.
Foster Pump Wks., Inc., Brooklyn, N. Y.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Granberg Corp., Oakland, Calif.
Healey Co., Lee, Glendale, Calif.
Jabsco Pump Co., Burbank, Calif.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Leiman Bros., Inc., Newark, N. J.
Levman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Lindquist Pump Corp., Culver City, Calif.
Madden Corp., Chicago, Ill.
Marco Co., Inc., Saginaw, Mich.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Nash Engineering Co., South Norwalk, Conn.
Northern Pump Co., Div. of Northern Ordnance Co., Columbia Heights P. O., Minneapolis, Minn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Robbins & Myers, Inc., Springfield, O.
Roots-Connersville Blower Div., Connersville, Ind.
Roper Corp., Geo. D., Rockford, Ill.
Roth Co., Roy E., Rock Island, Ill.
St. Louis Tool Co., St. Louis, Mo.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Sta-Rite Products, Inc., Delavan, Wis.
Sundstrand Hydraulic Div., Rockford, Ill. (for oil burners high and low pressure)
Taber Pump Co., Buffalo, N. Y.
Tuthill Pump Co., Chicago, Ill.
Vanton Pump and Equipment Corp., Hillside, N. J.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Waukesha Foundry Co., Waukesha, Wis.
Webster Electric Co., Racine, Wis.
Worthington Corp., Harrison, N. J.
Yale & Towne Mfg. Co., Stamford, Conn.

PUMPS, SEWAGE AND SLUDGE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Well Works, Aurora, Ill.
Aurora Pump Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Cooper Alloy Corp., Hillside, N. J.
Davidson Co., M. T., New York, N. Y.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Gorman-Rupp Industries, Inc., Belleville, O.
Healey Co., Lee, Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
Lawrence Pumps, Inc., Lawrence, Mass.
Marlow Pumps Division of Bell & Gossett Co., Ridgewood, N. J.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Robbins & Myers, Inc., Springfield, O.
Schneible Co., Claude B., Detroit, Mich.
Swaby Mfg. Co., Chicago, Ill.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, SEWAGE AND SLUDGE, SUBMERSIBLE

American Well Wks., Aurora, Ill.
Chicago Pneumatic Tool Co., New York.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Ferro Corp., Cleveland, O. (Compressed air operated)
Lawrence Pumps, Inc., Lawrence, Mass.
Weil Pump Co., Chicago, Ill.

PUMPS, STEAM

American-Marsh Pumps, Inc., Battle Creek, Mich.
Columbus Steam Pump Wks. Co., Columbus, O.
Coffin Co., J. S., Jr., Englewood, N. J.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Gardner-Denver Co., Quincy, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
National Steam Pump Co., Upper Sandusky, O.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Worthington Corp., Harrison, N. J.

PUMPS, SUMP

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Barnes Mfg. Co., Mansfield, O.
Barrett, Haentjens & Co., Hazleton, Pa.
Berkeley Pump Co., Berkeley, Calif.
Bruner Corp., Milwaukee, Wis.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Div., Borg-Warner Corp., Los Angeles, Calif.
Chicago Pneumatic Tool Co., New York.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dayton Electric Mfg. Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
Duro Co., Dayton, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Friermood Machine Works, Converse, Ind.
Gardner-Denver Co., Quincy, Ill.
Gorman-Rupp Industries, Inc., Belleville, O.
Goulds Pump, Inc., Seneca Falls, N. Y.
Healey Co., Lee., Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Kol-Master Corp., Oregon, Ill
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pumps, Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati. O.
Mall Tool Co., Chicago, Ill.
Marlow Pumps, Division of Bell & Gossett Co., Ridgewood, N. J.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Modern Woodmanse Sales Div., George Goetz Corp., W. Chicago, Ill.
Myers & Bro. Co., F. E., The, Ashland, O.
Noera Mfg. Co., Div., Chase Brass & Copper Co., Waterbury, Conn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Oxygen Equipment & Service Co., Chicago 20, Ill.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Peters-Dalton, Inc., Detroit, Mich.
Radiant Utilities Corp., Brooklyn, N. Y.
Robbins & Myers, Inc., Springfield, O.
Roth Co., Roy E., Rock Island, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skidmore Corp., St. Joseph, Mich.
Standard Electric Mfg. Co., West Berlin, N. J.
Sta-Rite Products, Inc., Delavan, Wis.
Swaby Mfg. Co., Chicago, Ill.
Taber Pump Co., Buffalo, N. Y.
Thor Power Tool Co., Aurora, Ill.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Uniflow Mfg. Co., Erie, Pa.
Union Steam Pump Co., Battle Creek, Mich.
Universal Mfg. Co., Berkeley, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J.
Wade Mfg. Co., Elgin, Ill.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Whitewater Pump Co., Inc., Whitewater, Wis.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, SUMP, SUBMERSIBLE

Aurora Pump Co., Aurora, Ill.
Byron Jackson Div., Borg-Warner Corp., Los Angeles, Calif.
Dayton Electric Mfg. Co., Chicago, Ill
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
Fairbanks, Morse & Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pumps, Inc., Lawrence, Mass.
Mall Tool Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Myers & Bro. Co., F. E., The, Ashland, O.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.

Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Roth Co., Roy E., Rock Island, Ill.
Swaby Mfg. Co., Chicago, Ill.
Universal Mfg. Co., Berkeley, Calif.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Whitewater Pump Co., Inc., Whitewater, Wis.

PUMPS, TURBINE TYPE

American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Coffin Co., J. S., Jr., Englewood, N. J.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H. Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chem. Corp., Los Angeles, Calif.
Skidmore Corp., St. Joseph, Mich.
Sta-Rite Products, Inc., Delavan, Wis.
Weinman Pump Mfg. Co., The, Columbus, O.

PUMPS, VACUUM

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Barrett, Haentjens & Co., Hazleton, Pa.
Beach-Russ Co., New York, N. Y.
Bury Compressor Co., Erie, Pa.
Chicago Pneumatic Tool Co., New York, N. Y.
Cooper Alloy Corp., Hillside, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham Co., C. A., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Eisler Engineering Co., Inc., Newark, N. J.
Foster Pump Wks., Inc., Brooklyn, N. Y.
Foster Wheeler Corp., New York, N. Y.
Fuller Co., Catasaqua, Pa.
Gardner-Denver Co., Quincy, Ill.
General Ceramics Corp., Keasbey, N. J. (Chemical stoneware, and porcelain)
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Joy Mfg. Co., Pittsburgh, Pa.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Leiman Bros., Inc., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Nash Engineering Co., South Norwalk, Conn.
National Steam Pump Co., Upper Sandusky, O.
Oxygen Equipment & Service Co., Chicago, Ill.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Research Vacuum Supply Co., Chicago, Ill.
Roots-Connersville Blower Div., Connersville, Ind.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skidmore Corp., St. Joseph, Mich.
Viking Pump Co., Cedar Falls, Ia.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Will Corp., Rochester, N. Y.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, VACUUM HEATING

American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Barnes & Jones, Inc., Boston, Mass.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham Co., C. A., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Faber Engineering Co., Inc., Philadelphia, Pa.
Gardner-Denver Co., Quincy, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Nash Engineering Co., South Norwalk, Conn.
Sarco Co., Inc., New York, N. Y.
Skidmore Corp., St. Joseph, Mich.
Sterling, Inc., Milwaukee, Wis.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.

PUMPS, VISCOUS LIQUIDS AND HEAVY MATERIALS

Aldrich Pump Co., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Beach-Russ Co., New York, N. Y.
Blackmer Pump Co., Grand Rapids, Mich.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Bump Pump Co., La Crosse, Wis.
C C Pump Mfg. Div., Palmyra, N. J.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Columbus Steam Pump Wks. Co., Columbus, O.
Cooper Alloy Corp., Hillside, N. J.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Engineer Co., New York, N. Y.
Fairbanks, Morse & Co., Chicago, Ill.
Ferro Corp., Cleveland, O. (compressed air operated)
Foster Pump Wks., Inc., Brooklyn, N. Y.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Gray Co., Inc., Minneapolis, Minn.
Healey Co., Lee, Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lawrence Pumps, Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence Mass.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Madden Corp., The, Chicago, Ill.
Marco Co., Inc., Saginaw, Mich.
Milton Roy Co., Philadelphia, Pa.
Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Robbins & Myers, Inc., Springfield, O.
Rockwell Co., W. S., Fairfield, Conn.
Roots-Connersville Blower Div., Connersville, Ind.
Roper Corp., Geo. D., Rockford, Ill.
Royalton Co., Inc., Gasport, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Taber Pump Co., Buffalo, N. Y.
Tuthill Pump Co., Chicago, Ill.
Union Steam Pump Co., Battle Creek, Mich.
Vanton Pump & Equipment Corp., Hillside, N. J.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUNCHES, SHEET METAL

Blackhawk Mfg. Co., Milwaukee, Wis.
Champion Blower & Forge Co., Lancaster, Pa.
Cleveland Punch & Shear Wks. Co., Cleveland, O.
Diamond Machine Tool Co., Pico, Calif.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Hendley & Whittemore Co., Beloit, Wis.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Leslie Welding Co., Inc., Chicago, Ill.
M-M-A, Inc., Lancaster, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Nye Tool Co., Chicago, Ill.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Reiner & Campbell Co., Inc., Newark, N. J.
Swaine Mfg. Co., Fred J., St. Louis, Mo.
Thor Tool & Die Co., San Leandro, Calif.
Webb Corp., The, Webb City, Mo.
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.
Weidemann Machine Co., Phialdelphia, Pa.
Zeh & Hahnemann Co., Newark, N. J.

PURGERS, REFRIGERANT GAS

Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesboro, Pa.
Mueller Brass Co., Port Huron, Mich.
Reco Products Div., Recony Corp., New York, N. Y.
Vilter Mfg. Co., Milwaukee, Wis.
York Corp., York, Pa.

PUSHERS, PIPE, HYDRAULIC

Blackhawk Mfg. Co., Milwaukee, Wis.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Giant Mfg. Co., Council Bluffs, Ia.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Wilson Co., K. R., Arcade, N. Y.

RACKS, STORAGE, PIPE

Adams Co., The, Dubuque, Ia.
Berger Div., Republic Steel Corp., Canton, O.
California Steel Products Div., Richmond, Calif.
Columbian Steel Tank Co., Kansas City, Mo.
Haertel Co., Walter, Minneapolis, Minn.
Steel City Electric Co., Pittsburgh, Pa.
Unistrut Products Co., Chicago, Ill.

RADIANT HEAT MEASUREMENT

See Radiometers

RADIANT HEAT THERMOSTATS

See Thermostats, Radiant Heat

RADIANT HEATING AND COOLING

See Coils and Panels, Radiant Heating, Prefabricated

RADIANT HEATING ELECTRICAL CONDUCTORS

See Conductors, Electrical, for Radiant Heating

RADIATION, BASEBOARD

For special fittings, see Fittings, Pipe, Special, for Baseboard Radiation

RADIATION, BASEBOARD, FERROUS

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Autorad Inc., Chicago, Ill.
Baseline Mfg. Co., Minneapolis, Minn.
Brown Products Co., Forest Hills, N. Y.
Burnham Corp., Irvington, N. Y.

Crane Co., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Farrell Associates, Charles, Valencia, Pa.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Koven & Bro., L. O., Inc., Jersey City, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
National-U. S. Radiator Corp., Johnstown, Pa.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Smith Co., Inc., H. B., The, Westfield, Mass.
Spi-Rol-Fin Corp., Pequannock, N. J.
Sterling Radiator Co., Inc., Westfield, Mass.
Trane Co., The, La Crosse, Wis.
Tranter Mfg., Inc., Lansing, Mich.
Union Asbestos & Rubber Co., Chicago, Ill.
Utica Radiator Corp., Utica, N. Y.
Vulcan Radiator Co., Hartford, Conn.
Weil-McLain Co., Michigan City, Ind.

RADIATION, BASEBOARD, NON-FERROUS

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Argo Sales, Hartford, Conn.
Baseline Mfg. Corp., Minneapolis, Minn.
Beacon-Morris Corp., Boston, Mass.
Brown Products Co., Forest Hills, N. Y.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Convector Corp. of America, Washington, D. C.
Dunham Co., C. A., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Ejay Baseboard Mfg. Co., Winsted, Conn.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Farrell Associates, Charles, Valencia, Pa.
Fedders-Quigan Corp., Buffalo, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
General Automatic Products Corp., Baltimore, Md.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Huron Boiler Co., Detroit, Mich.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kritzer Radiant Coils, Inc., Chicago, Ill.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Patco Mfg. Co., Philadelphia, Pa.
Radiant Baseboard Panels, Inc., Newington, Conn.
Radiant-Ray Radiation, Inc., Newington, Conn.
Rempe Co., Chicago, Ill.
Republic Products Co., Philadelphia, Pa.
Rittling Corp., Buffalo, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Slant-Fan Radiator Corp., Richmond Hill, N. Y.
Spi-Rol-Fin Corp., Pequannock, N. J.
Stedco Products, Wilkes-Barre, Pa.
Sterling Radiator Co., Inc., Westfield, Mass.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Tuttle & Bailey, Inc., New Britain, Conn.
Union Asbestos & Rubber Co., Chicago, Ill.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Young Radiator Co., Racine, Wis.

RADIATION, CONVECTION TYPE, ELECTRIC HEATING ELEMENT

Circle-Air Industries, Inc., Brooklyn, N. Y.
Crystalheat Co., Van Nuys, Calif.
Electromode Corp., Rochester, N. Y.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Meier Elec. & Mach. Co., Inc., Indianapolis, Ind.
National-U. S. Radiator Corp., Johnstown, Pa.
Paley Mfg. Corp., Brooklyn, N. Y.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.

RADIATION, CONVECTION TYPE, FERROUS

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Argo Sales, Hartford, Conn.
Auburn Burner Co., Auburn, Ind.
Autorad Inc., Chicago, Ill.
Brown Fintube Co., The, Elyria, O.
Brown Products Co., Forest Hills, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Tranter Mfg., Inc., Lansing, Mich.
Union Asbestos & Rubber Co., Chicago, Ill.
Webster & Co., Warren, Camden, N. J.
Weil-McLain Co., Chicago, Ill.

RADIATION, CONVECTION TYPE, NON-FERROUS

Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Argo Sales, Hartford, Conn.
Beacon-Morris Corp., Boston, Mass.
Brown Fintube Co., The, Elyria, O.
Brown Products Co., Forest Hills, N. Y.
Convector Corp. of America, Washington, D. C.
Dunham Co., C. A., Chicago, Ill.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders-Quigan Corp., Buffalo, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kehm Corp., The, Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt Inc., John J., Philadelphia, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Patco Mfg. Co., Philadelphia, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Republic Products Co., Philadelphia, Pa.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Spartan Convector Co., Inc., Brooklyn, N. Y.
Tenney Engineering Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Tuttle & Bailey, Inc., New Britain, Conn.
Union Asbestos & Rubber Co., Chicago, Ill.
Vapor Heating Corp., Chicago, Ill.
Webster & Co., Warren, Camden, N. J.
Young Radiator Co., Racine, Wis.

RADIATION, DIRECT

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Burnham Corp., Irvington, N. Y.
Clow & Sons, James B., Chicago, Ill. (Gas fired)
Crane Co., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Rittling Corp, The, Buffalo, N. Y.
Utica Radiator Corp., Utica, N. Y.
Weil-McLain Co., Michigan City, Ind.
Wilson Engineering Corp., Chicago, Ill.

RADIATION, FIN TUBE TYPE

Alstrom Corp., The, New York, N. Y.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Argo Sales, Hartford, Conn.
Auburn Burner Co., Auburn, Ind.
Autorad Inc., Chicago, Ill.
Baseline Mfg. Co., Minneapolis, Minn.
Brown Products Co., Forest Hills, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham Co., C. A., Chicago, Ill.
Edwards Engineering Corp., Pompton Plains, N. J.
Fedders-Quigan Corp., Buffalo, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Radiant Baseboard Panels, Inc., Newington, Conn.
Radiant-Ray Radiation, Inc., Newington, Conn.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Smith Co., Inc., H. B., The, Westfield, Mass.
Spi-Rol-Fin Corp., Pequannock, N. J.
Stedco Products, Wilkes-Barre, Pa.
Sterling Radiator Co., Inc., Westfield, Mass.
Super Radiator Corp., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
Vapor Heating Corp., Chicago, Ill.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
York-Shipley, Inc., York, Pa.

RADIATOR AND CONVECTOR HUMIDIFIERS

See Humidifiers for Radiators and Convectors

RADIATOR HANGERS

See Hangers or Brackets, Radiator

RADIATOR ORIFICES

See Orifices, Radiator

RADIATOR ORIFICE VALVES

See Valves, Radiator, Orifice

RADIATOR VALVES

See Valves, Radiator

RADIATOR VENT VALVE HUMIDIFIERS

See Humidifiers, Radiator Vent Valve

RADIATORS, ELECTRIC

Burnham Corp., Irvington, N. Y.
Conco Engineering Wks., Div. of H. D. Conkey & Co, Mendota, Ill.
Crystalheat Co., Van Nuys, Calif.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
ThermoRay Corp., Irvington-On-Hudson, N. Y.
Trent, Inc., Philadelphia, Pa.

RADIATORS, GAS FIRED

Clow & Sons, James B., Chicago, Ill.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.

RADIATORS, HUMIDIFYING
Murray Mfg. Co., D. J., Wausau, Wis.

RADIOMETERS, THERMAL, FOR RADIANT HEAT MEASUREMENTS
Beckman & Whitley, Inc., San Carlos, Calif.

RAMS, WATER, FOR CLEANING OUT PIPE LINES
Nye Tool Co., Chicago, Ill.

RATCHET WRENCHES
See Wrenches, Ratchet

REAMERS, PIPE
American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp, Greenfield, Mass.
Mueller Co., Decatur, Ill.
Nye Tool Co., Chicago, Ill.
Reed Mfg Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Thor Power Tool Co., Aurora, Ill.
Toledo Pipe Threading Machine Co., Toledo, O.

RECIPROCATING PUMPS
See Pumps, Reciprocating

RECORDER-CONTROLLERS, COMBINED TEMPERATURE AND HUMIDITY
American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDER-CONTROLLERS, HUMIDITY
American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDER-CONTROLLERS, PRESSURE
American Meter Co., Inc., Philadelphia, Pa.
Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
Hagan Corp., Pittsburgh, Pa.
Hamilton Div., Baldwin-Lima-Hamilton Corp., Hamilton, O.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa
Power Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDER-CONTROLLERS, TEMPERATURE
American Instrument Co., Inc., Silver Spring, Md.
American Meter Co., Inc., Philadelphia, Pa
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., The, Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
West Insturment Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

RECORDER-TOTALIZERS, TIME, FOR HEATING SYSTEMS
Au-Temp Co. Corp., New York, N. Y.
Heat-Timer Corp., New York, N. Y.

RECORDERS, CARBON DIOXIDE
Cole-Sewell Engineering Co., St. Paul, Minn.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Defender Instrument and Regulator Co., St. Louis, Mo.
Fischer & Porter Co., Hatboro, Pa
Hays Corp., Michigan City, Ind.
Leeds & Northrup Co., Philadelphia, Pa.
Permutit Co., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Victory Engineering Corp., Union, N. J.

RECORDERS, COMBINED TEMPERATURE AND HUMIDITY
Abbeon Supply Co., Jamaica, N. Y.
American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Thwing-Albert Instrument Co., Philadelphia.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDERS, DEW POINT
American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Surface Combustion Corp., Toledo, O.

RECORDERS, DRAFT
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Republic Flow Meters, Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Victory Engineering Corp., Union, N. J.

RECORDERS, HUMIDITY
American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
Leeds & Northrup Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDERS, LIQUID LEVEL
Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Defender Instrument & Regulator Co., St. Louis, Mo.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Liquidometer Corp., Long Island City, N. Y.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Uehling Instrument Co., Paterson, N. J.
Westinghouse Electric Corp., Pittsburgh, Pa
Yarnall-Waring Co., Philadelphia, Pa.

RECORDERS, OXYGEN
Bailey Meter Co., Cleveland, O.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Mine Safety Appliances Co., Pittsburgh, Pa
Victory Engineering Corp., Union, N. J.

RECORDERS, PRESSURE AND VACUUM
American Meter Co., Inc., Philadelphia, Pa
Bacharach Industrial Instrument Co., Pittsburgh, Pa
Bailey Meter Co., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.

Fischer & Porter Co., Hatboro, Pa.
Flow Corp., Cambridge, Mass.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Hagan Corp., Pittsburgh, Pa.
Hamilton Div., Baldwin-Lima-Hamilton Corp., Hamilton, O.
Hastings Instrument Co., Inc., Warwick, Va.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Swartwout Co., The, Cleveland, Ohio
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Uehling Instrument Co., Paterson, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electric Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDERS, SMOKE DENSITY

Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
De-Tec-Tronic Corp., Chicago, Ill.
Edwards, L. V., Rockville Center, N. Y.
Electronics Corp. of America, Cambridge, Mass.
Ess Instrument Co., Bergenfield, N. J.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Leeds & Northrup Co., Philadelphia, Pa.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Sterns-Flinn Corp., New York, N. Y.

RECORDERS, TEMPERATURE

American Instrument Co., Inc., Silver Spring, Md.
American Meter Co., Inc., Philadelphia, Pa.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Moore Products Co., Philadelphia, Pa.
Palmer Thermometers, Inc., Cincinnati (Norwood), O. (Mercury-actuated)
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
Victory Engineering Corp., Union, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

RECORDING THERMOMETERS

See Recorders, Temperature

RECOVERY EQUIPMENT, AIR

See Adsorbers, Odor

REDUCERS, SPEED

Abart Gear & Machine Co., Chicago, Ill.
Adams Co., The, Dubuque, Iowa
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Bodine Electric Co., Chicago, Ill.
Boston Gear Wks., Quincy, Mass.
Brown-Brockmeyer Co., Inc., Dayton, O.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Cleveland Worm & Gear Co., Cleveland, O.
De Laval Steam Turbine Co., Trenton, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Falk Corp., Milwaukee, Wis.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Hewitt-Robins, Inc., Stamford, Conn.
Janette Electric Mfg. Co., Morton Grove, Ill.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Lima Electric Motor Co., The, Lima, O.
Limitorque Corp., Philadelphia, Pa.
Link Belt Co., Chicago, Ill.
Michigan Tool Co., Detroit, Mich.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Poole Foundry & Machine Co., Baltimore, Md.
Reliance Electric & Engineering Co., Cleveland, O.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Shallcross Controls, Inc., Milwaukee, Wis.
Star-Kimble Motor Div., Miehle Prntg. Press & Mfg. Co., Bloomfield, N. J.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Sterling Electric Motors, Inc., Los Angeles, Calif.
Terry Steam Turbine Co., The, Hartford, Conn.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.

REFRACTORIES AND REFRACTORY CEMENT

Allen Co., Robert G., Mechanicsville, N. Y.
Armstrong Cork Co., Lancaster, Pa.
Babcock & Wilcox Co., New York, N. Y.
Basic Refractories, Inc., Cleveland, O.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Elraco Engineering Co., Los Angeles, Calif.
Fireline Stove & Furnace Lining Co., Chicago, Ill.
France Refractories, Co., J. H., Snow Shoe, Pa.
Green Fire Brick Co., Mexico, Mo.
Johns-Manville, New York, N. Y.
Krehbiel Co., J. H., Chicago, Ill.
Monogram Products Co., Inc., Philadelphia, Pa.
Nebel Mfg. Co., Cleveland, O.
Norton Co., Worcester, Mass.
Plibrico Co., Chicago, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc, New York, N. Y.
Ramtite Co., The, Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y.
Reintjes Co., Geo. P., Kansas City, Mo.
Rex Clay Products Co., Detroit, Mich.
Robinson Clay Product Co., The, Akron, O.
Rutland Fire Clay Co., Rutland, Vt.
S.O.S. Products Co, Inc., Brooklyn, N. Y
Sauereisen Cements Co., Pittsburgh, Pa.
Saverite Engineering Co., Hoboken, N. J.
Standard Fuel Engineering Co., Detroit, Mich.
Taylor Sons Co., Charles, Cincinnati, O.
United States Stoneware Co., New York, N. Y.
Zonolite Co., Chicago, Ill.

REFRIGERANT DEHYDRATORS

See Dehydrators, Refrigerant

REFRIGERANT FILTERS

See Filters, Refrigerant

REFRIGERANT GAGE SETS

See Gage Sets, Refrigeration

REFRIGERANT GAS PURGERS

See Purgers, Refrigerant Gas

REFRIGERANT SLUG ELIMINATORS

See Eliminators, Slug, Refrigerant

REFRIGERANTS

American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif. (sulphur dioxide methyl chloride)
Ansul Chemical Co., Refrigeration Div., Marinette, Wis. (methyl chloride, sulphur dioxide)
Armour and Co., Ammonia Div., Chicago, Ill. (Anhydrous ammonia)
Carrier Corp., Syracuse, N. Y. (carrene)
Dow Chemical Co., The, Midland, Mich.
du Pont de Nemours & Co., Inc., E. I., Kinetic Chemicals Div., Wilmington, Del. ("Freon" fluorinated hydrocarbon refrigerants)
du Pont de Nemours & Co., Inc., E. I., Electrochemicals Dept., Wilmington, Del. (Methyl chloride and methylene chloride)
General Chemical Div., Allied Chemical & Dye Corp., New York, N. Y. (Trichloromonofluromethane and dichlorodifluromethane, monochlorodifluoromethane, trichlorotrifluoroethane)
Liquid Carbonic Corp., Chicago, Ill. (carbon dioxide)
Monsanto Chemical Co., Merimac Div., Boston, Mass. (anhydrous ammonia)
Pennsylvania Salt Mfg. Co., Philadelphia, Pa. (ammonia)
Pure Carbonic Co., Div. of Air Reduction Co., Inc., New York, N. Y. (carbon dioxide)
Virginia Smelting Co., West Norfolk, Va., (Methyl chloride, liquid sulphur dioxide.)

REFRIGERATING COMPRESSORS

See Compressors, Refrigerating

REFRIGERATION ACCUMULATORS

See Accumulators, Refrigeration

REFRIGERATION CONTROLS

See Valves, Refrigeration

REFRIGERATION FITTINGS

See Fittings, Refrigeration

REFRIGERATION MANIFOLDS

See Manifolds, Refrigeration

REFRIGERATION VALVES

See Valves, Refrigeration

REGISTERS

See also Diffusers; Grilles; Panels, Perforated, for Air Diffusion

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Auer Register Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Char-Gale Mfg. Co., Minneapolis, Minn.
Controlair Mfg. Co., Los Angeles, Calif.
Diamond Mfg. Co., Wyoming, Pa.
Dole Valve Co., The, Chicago, Ill. (Automatic register)
Empire Ventilation Equipment Co., Long Island City, N. Y.
General Register Corp., Cedar Grove, N. J.
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Hastings Air Control, Inc., Omaha, Nebr.
Hendrick Mfg. Co., Carbondale, Pa.
Independent Register Co., Cleveland, O.
Krueger Air Conditioning Co., Tucson, Ariz.
Lima Register Co., The, Lima, O.
Louvra Mfg. & Sales Co., Union, N. J.
Martin Metal Products Corp., Ferndale, Mich.

Midco Register Corp., St. Paul, Minn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Patco Mfg. Co., Philadelphia, Pa.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Standard Stamping & Perforating Co., Chicago, Ill.
Stewart Mfg. Co., Inc., Cedar Grove, N. J.
Thermo-Base Div., Gerwin Industries, Michigan City, Ind.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Viking Mfg. Corp., Cleveland, O.
Waterloo Register Co., Waterloo, Ia.
Young Regulator Co., Cleveland, O.

REGISTER UNITS, FOR SECONDARY AIR SUPPLY FOR OIL BURNERS

Faber Engineering Co., Philadelphia, Pa.
National Airoil Burner Co., Inc., Philadelphia, Pa.

REGULATORS, AIR VELOCITY

Ace Instrument Co., Inc., Brooklyn, N. Y.
Barber-Colman Co., Rockford, Ill.
General Register Corp., Cedar Grove, N. J.
Hastings Instrument Co., Inc., Warwick, Va.
Hays Corp., Michigan City, Ind.
Johnson Service Co., Milwaukee, Wis.
Shallcross Controls, Inc., Milwaukee, Wis.
Taylor Instrument Companies, Rochester, N. Y.
Thermal Agency, Houston, Tex.

REGULATORS, DAMPER SETS

Ace Instrument Co., Inc., Brooklyn, N. Y.
Acme Mfg. Co., Philadelphia, Pa.
Acro Mfg. Co., The, Columbus, O.
Adams Co., The, Dubuque, Ia.
Ashcraft Co., J. P., Dallas, Tex.
Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Crown Controls Co., Inc., New Bremen, O.
Defender Instrument & Regulator Co., St. Louis, Mo.
Detroit Controls Corp., Detroit, Mich.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Elgin Mfg. Co., Long Island City, N. Y.
Field Control Div., H. D, Conkey & Co., Mendota, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill. (electric)
Gerett Corp., M. A., Milwaukee, Wis.
Hart & Cooley Mfg. Co., Holland, Mich.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Shallcross Controls, Inc., Milwaukee, Wis.
Thermal Agency, Houston, Tex.
United States Register Co., Battle Creek, Mich.
Wa-Trol, Houston, Tex.
Young Regulator Co., Cleveland, O.

REGULATORS, DRAFT, COMBUSTION

A-P Controls Corp., Milwaukee. Wis.
Ace Instrument Co., Inc., Brooklyn, N. Y.
Askania Regulator Co., Chicago, Ill.
Automatic Devices Co., Inc., Western Springs, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cash Co., A. W., Decatur, Ill.
Cleveland Fuel Equipment Co., Cleveland, O.
Cole-Sewell Engineering Co., St. Paul, Minn.
Combustion Equipment Co., Moline, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
Engineer Co., New York, N. Y.
Ess Instrument Co., Bergenfield, N. J.
Field Control Div., H. D. Conkey & Co., Mendota. Ill.
Foster Wheeler Corp., New York, N. Y.
Foxboro Co., Foxboro, Mass.
Fuel Reduction Corp., Chicago, Ill.
Fuelguard Co. Dallas, Tex.
General Controls Co., Glendale, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Kol-Master Corp., Oregon, Ill.
Krueger Sentry Gauge Co., Green Bay, Wis.
Leahy Mfg. Co., Los Angeles, Calif.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Regulator Co., Boston, Mass.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mirror Patented Stove Pipe Co., Hartford Conn.
Nichols Instrument Co., Baltimore, Md.
Preferred Utilities Mfg. Corp., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill. (Industrial)
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.
Simplex Mfg. Co., Fond du Lac, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Webster Engineering Co., Tulsa, Okla.
Worner Electronic Devices, Rankin, Ill.

REGULATORS, FLUID FLOW, FOR CONSTANT VOLUME

Independent of Pressure

A-P Controls Corp., Milwaukee, Wis.
Askania Regulator Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Cla-Val Co., Newport Beach, Calif.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Gray Co., Inc., Minneapolis, Minn.
Hays Corp., Michigan City, Ind.
Kates Co., W. A., The, Deerfield, Ill.
Klipfel Valves, Inc., Hamilton, O.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Taco Heaters, Inc., Cranston, R. I.

REGULATORS, LEVEL, LIQUID

Alco Valve Co., St. Louis, Mo.
Askania Regulator Co., Chicago, Ill.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Control Co., St. Paul, Minn.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Burrows Mfg. Co., F. A., York, Pa.
Cla-Val Co., Newport Beach, Calif.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument & Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Griscom-Russell Co., The, Massillon, O.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Instruments, Inc., Tulsa, Okla.
Johnson Corp., The, Three Rivers, Mich.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Magnetrol, Inc., Chicago, Ill.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Penn Controls, Inc., Goshen, Ind.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Sarco Co., Inc., New York, N. Y.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.
United Electric Controls Co., Watertown, Mass.
Watts Regulator Co., Lawrence, Mass.

REGULATORS, PRESSURE, AIR

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Ace Instrument Co., Inc., Brooklyn, N. Y.
American Meter Co., Inc., Philadelphia, Pa.
Askania Regulator Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Binks Mfg. Co., Chicago, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia.
Burrows Mfg. Co., F. A., York, Pa.
CCA Products, Inc., Glendale, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
DeVilbiss Co., The, Toledo, O.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif.
Gray Co., Inc., Minneapolis, Minn.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hanna Engineering Wks., Chicago, Ill.
Hays Corp., Michigan City, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Nielan Regulator Co., Boston, Mass.

McAlear Mfg. Co., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Monitor Controller, Rockland, Mass.
Moore Products Co., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
National Cylinder Gas Co., Chicago, Ill.
Norgren Co., C. A., Englewood, Colo.
Norwalk Valve Co., Norwalk, Conn.
Penn Controls, Inc., Goshen, Ind.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Perfecting Service Co., Charlotte, N. C.
Powers Regulator Co., Skokie, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Smith Co., S. Morgan, York, Pa.
Smith Welding Equipment Corp., Minneapolis, Minn.
Spence Engineering Co., Inc., Walden, N. Y.
Spray Engineerig Co., Somerville, Mass.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond Co., Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
United Electric Controls Co., Watertown, Mass.
Universal Controls Corp., Dallas, Tex.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Young Regulator Co., Cleveland, O.

REGULATORS, PRESSURE, GAS

Ace Instrument Co., Inc., Brooklyn, N. Y.
American Meter Co., Inc., Philadelphia, Pa.
Askania Regulator Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Conoflow Corp., Philadelphia, Pa.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Harris Calorific Co., The, Cleveland, O.
Hays Corp., Michigan City, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Industrial Gas Div., Liquid Carbonic Corp., Chicago, Ill.
Jordan Corp., Cincinnati, O.
K-G Equipment Co., Allentown, Pa.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Liquid Carbonic Corp., The, Chicago, Ill.
Mason-Neilan Regulator Co., Boston, Mass.
Maxitrol Co., Detroit, Mich.
McAlear Mfg. Co., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Monitor Controller, Rockland, Mass.
Moore Products Co., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
Mueller Climatrol, Milwaukee, Wis.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
National Cylinder Gas Co., Chicago, Ill.
North American Mfg. Co., Cleveland, O.
Norwalk Valve Co., South Norwalk, Conn.
Penn Controls, Inc., Goshen, Ind.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill. (Industrial)
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Smith Co., S. Morgan, York, Pa.
Smith Welding Equipment Corp., Minneapolis, Minn.
Spence Engineering Co., Inc., Walden, N. Y.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Strong, Carlisle & Hammond Co., Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thermac Co., Los Angeles, Calif.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.
Universal Controls Corp., Dallas, Tex.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Weldit, Inc., Detroit, Mich.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

REGULATORS, PRESSURE, HOT WATER HEATING SYSTEMS

Bailey Co., Chas., M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Burrows Mfg. Co., F. A., York, Pa.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Mfg. Co., Cleveland, O.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Defender Instrument & Regulator Co., St. Louis, Mo.
Detroit Controls Corp., Detroit, Mich.
Fisher Governor Co., Marshalltown, Ia.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kehm Corp., The, Chicago, Ill.
Klipfel Valves, Inc., Hamilton, O.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Mueller Co., Decatur, Ill.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
White-Rodgers Electric Co., St. Louis, Mo.
Yula Water Heaters Inc., New York, N. Y.

REGULATORS, PRESSURE, LIQUID

Askania Regulator Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Automatic Control Co., St. Paul, Minn.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Blackmer Pump Co., Grand Rapids, Mich.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Controller Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Philadelphia, Pa.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eddington Metal Specialty Co., Eddington, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Johnson Service Co., Milwaukee, Wis.
Jordan Corp., Cincinnati, O.
Justus Steam Trap Co., Napanoch, N. Y.
Kaye & McDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc, Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Monitor Controller, Rockland, Mass.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Norgren Co., C. A., Englewood, Colo.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Chicago, Ill.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond Co., Cleveland, O.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
United Electric Controls Co., Watertown Mass.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
White-Rodgers Electric Co., St. Louis, Mo.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (Feed water)

REGULATORS, STATIC PRESSURE, AIR DUCT

Ace Instrument Co., Inc., Brooklyn, N. Y.
Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Daytronic Corp., Dayton, O.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Shallcross Controls, Inc., Milwaukee, Wis.

REGULATORS, TEMPERATURE

A-P Controls Corp., Milwaukee, Wis.
Acro Mfg. Co., The, Columbus, O.
Aerco Corp., Northvale, N. J.
Allen-Bradley Co., Milwaukee, Wis.
American Instrument Co., Inc., Silver Spring, Md.
Atlas Valve Co., Newark, N. J.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Burling Instrument Co., Chatham, N. J.
Century Instrument Co., Detroit, Mich.
Conoflow Corp., Dept. P, Philadelphia, Pa.
Crown Controls Co., Inc., New Bremen, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Detroit Controls Corp., Detroit, Mich.
Eclipse Fuel Engineerig Co., Rockford, Ill.
Fenwal Inc., Ashland, Mass.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
H-B Instrument Co., Philadelphia, Pa.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Jordan Corp., Cincinnati, O.
Kaye & McDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Skokie, Ill.
Klipfel Valves, Inc., Hamilton, O.
Lawler Automatic Controls, Inc., Mount Vernon, N. Y.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McAlear Mfg. Co., Chicago, Ill.
McCorkle Co., D. H., Berkeley, Calif.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Controls, Inc., Goshen, Ind.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Co., Skokie, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc, New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Security Valves Corp., Glendale, Calif.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Tallmadge System, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
West Instrument Corp., Chicago, Ill.
Wheelco Instruments Co., Chicago, Ill.
White-Rodgers Electric Co., St. Louis, Mo. (Hydraulic-Action)

RELAYS, ELECTRICAL

A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J. (time delay)
Advance Electric and Relay Co., Burbank, Calif.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Allen-Bradley Co., Milwaukee, Wis.
Allied Control Co., Inc., New York, N. Y.
American Instrument Co., Inc., Silver Spring, Md.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Au-Temp-Co Corp., New York, N. Y.
Automatic Electric Mfg. Co., Mankato, Minn.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Clark Controller Co., Cleveland, O.
Consolidated Metal Products Corp., Albany, N. Y.
Cook Electric Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Daytronic Corp., Dayton, O.
Deltron, Inc., Philadelphia, Pa.
Detroit Controls Corp., Detroit, Mich.
Ebert Electronics Corp., Queens Village, N. Y.
Edison, Inc., Thos. A., Instrument Div., West Orange, N. J.
Electro-Switch & Controls Inc., Culver City, Calif.
Ess Instrument Co., Bergenfield, N. J.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Giannini & Co., Inc., G.M., Pasadena, Calif.
Guardian Electric Mfg. Co., Chicago, Ill.
H-B Instrument Co., Philadelphia, Pa.
Hart Mfg. Co., The, Hartford, Conn.
Haydon Co., A. W., Waterbury, Conn.
Industrial Engineering Corp., Terre Haute, Ind.
International Business Machines Corp., New York, N. Y.
Leach Relay Co., Los Angeles, Calif.
McCorkle Co., D. H., Berkeley, Calif.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monitor Controller, Rockland, Mass.
National Time & Signal Corp., Detroit, Mich.
Penn Controls, Inc., Goshen, Ind.
Philadelphia Thermometer Co., Philadelphia.
Potter & Brumfield Sales Co., Princeton, Ind.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass. (motor starting relays)
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Struthers-Dunn, Inc., Pitman, N. J.
Synchro-Start Products, Inc., Skokie, Ill.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Vapor Heating Corp., Chicago, Ill.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
White-Rodgers Electric Co., St. Louis, Mo.
Zenith Electric Co., Chicago, Ill.

RELAYS, PNEUMATIC

Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Conoflow Corp., Dept, P, Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.

RELIEF VALVES

See Valves, Relief

REPAIR CLAMPS

See Clamps, Pipe Repair

REPAIR PLUGS FOR TANKS

See Plugs, Repair, for Tanks

RESEATERS, VALVE

Chicago Specialty Mfg. Co., Chicago, Ill.
Economy Valve Seat Co., Chicago, Ill.
Leavitt Machine Co., Orange, Mass.
Skinner Co., M. B., South Bend, Ind.
Standard Reseater Corp., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Thor Power Tool Co., Aurora, Ill.

REVERSE REFRIGERATION CYCLE UNITS

See Units, Air Conditioning, Reverse Refrigeration Cycle

RINGS, PISTON, FOR COMPRESSORS

Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Maloney Co., F. H., Houston, Tex.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Perfect Circle Corp., Hagerstown, Ind.
Sealed Power Corp., Muskegon, Mich.

RINGS, WELDING

Alco Products, Inc., Schenectady, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Arcos Corp., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Midwest Piping Co., Inc., St. Louis, Mo.
Robvon Backing Ring Co., Elizabeth, N. J.
Tube Turns, A Div. of National Cylinder Gas. Co., Louisville, Ky.
Wedge Protectors, Inc., Cleveland, O.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

ROD, GAS WELDING

Air Reduction Sales Co., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alloy Rods Co., York, Pa.
Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
American Steel & Wire Div., United States Steel, Cleveland, O.
Arcos Corp., Philadelphia, Pa.
Atlantic Steel Co., Atlanta, Ga.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Crucible Steel Co. of America, Pittsburgh, Pa.
Dow Chemical Co., The, Midland, Mich.
Duraloy Co., Scottdale, Pa. (Stainless)
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
International Nickel Co., The, New York, N. Y.
K-G Equipment Co., Allentown, Pa.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Maurath, Inc., Cleveland, O.
Mir-O-Col Alloy Co., Los Angeles, Calif. (for hard facing)

National Cylinder Gas Co., Chicago, Ill.
Page Steel & Wire Division of American Chain & Cable Co., Inc., Monessen, Pa.
Revere Copper and Brass, Incorporated, New York, N. Y.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Youngstown Sheet & Tube Co., Youngstown, O.
Weldit, Inc., Detroit, Mich.

ROLLER BEARINGS
See Bearings, Roller

ROOF COOLERS
See Systems, Roof Spraying

ROOF SPRAYING SYSTEMS
See Systems, Roof Spraying

ROOF VENTILATORS
See Ventilators, Roof

ROOM HUMIDIFIERS
See Humidifiers, Unit, Room Type; and Units, Air Conditioning, Winter

ROOM THERMOSTATS
See Thermostats, Room or Wall

ROTARY PUMPS
See Pumps, Rotary

RUBBER BELTING
See Belting, Flat, Rubber

RUBBER PACKING
See Packing, Rubber and Synthetic

RUBBER PIPE
See Pipe, Hard Rubber

SADDLE VALVES
See Valves, Saddle

SADDLE TEES
See Fittings, Pipe, Saddle Tee

SAFETY VALVES
See Valves, Safety, Steam

SAWS, ELECTRIC, PORTABLE
Black & Decker Mfg. Co., The, Towson, Md.
Eveready Briksaw Co., Chicago, Ill. (for concrete)
Mall Tool Co., Chicago, Ill.
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Oster Mfg. Co., John, Milwaukee, Wis.
Porter-Cable Machine Co., Syracuse, N. Y.
Producers & Distributors, Inc., Allentown, Pa.
R C S Tool Corp., Joliet, Ill.
Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago (Cicero), Ill.
Stanley Works, The, New Britain, Conn.
Wallace Supplies Mfg. Co., Chicago, Ill. (for abrasive materials)

SCAFFOLDS, PORTABLE
American Ladder & Scaffold Co., Miami, Fla.
Beaver Advance Corp., Ellwood City, Pa.
Up-Right Scaffolds, Berkeley, Calif.
Waco Steel Scaffolding, Inc., Waco, Tex.

SCALE CONTROL
See Devices, Electrolytic; Treatment, Steam System; Treatment, Water

SCALE REMOVAL, CHEMICAL SERVICE FOR
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Ferr-X Corp., Clifton, N. J.
Brown Electro Co., Oklahoma City, Okla. (electrolytic protector)
Chemical Solvent Co., Birmingham, Ala.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Dearborn Chemical Co., Chicago, Ill.
Dowell Inc., Tulsa, Okla.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Oakite Products, Inc., New York, N. Y.

SCOOPS, AIR, FOR DEFLECTING FLOW IN DUCTS
General Register Corp., Cedar Grove, N. J.
Stewart Mfg. Co., Inc., Cedar Grove, N. J.
Titus Mfg. Corp., Waterloo, Ia.
Waterloo Register Co., Inc., Waterloo, Ia.

SCREENS, SUN REFLECTING
Kaiser Aluminum & Chemical Corp., Oakland, Calif.
Kane Mfg. Corp., Kane, Pa.
Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.

SCREWS, SHEET METAL
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American Screw Co., Willimantic, Conn.
Continental Screw Co., New Bedford, Mass.
Elco Tool & Screw Corp., Rockford, Ill.
Harper Co., H. M., Morton Grove, Ill.
Industrial Screw Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
National Lock Co., Inc., Rockford, Ill.
Paine Co., Addison, Ill.
Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.
Pheoll Mfg. Co., Chicago, Ill.
Rockford Screw Products Co., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Shakeproof Div., Illinois Tool Wks., Elgin, Ill.
Star Stainless Screw Co., Paterson, N. J.
United States Register Co., Battle Creek, Mich.

SEALS, SHAFT, MECHANICAL
Byron Jackson, Div. of Borg-Warner Corp., Los Angeles, Calif.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Crane Packing Co., Chicago, Ill.
Felt Products Mfg. Co., Chicago, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Garlock Packing Co., Palmyra, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Magnetic Seal Corp., Barrington, R. I.
Morganite, Inc., Carbon Specialties Div., Long Island City, N. Y.
Rotary Seal Co., Chicago, Ill.
Schwitzer-Cummins Co., Indianapolis, Ind.
Sealol Corp., Providence, R. I.
Syntron Co., Homer City, Pa.
United States Gasket Co., Camden, N. J.
Wolfe Co., Inc., The Franklin C., Culver City, Calif.

SEALS, TERMINAL, FOR COMPRESSORS
Minnesota Rubber & Gasket Co., Minneapolis, Minn.
Wolfe Co., Inc., The, Franklin C., Culver City, Calif.

SEAMLESS PIPE
See Pipe, Steel, Seamless

SEPARATORS, AIR
ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Adams Co., Inc., R. P., Buffalo, N. Y.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Anderson Co., V. D., The, Cleveland, O.
Automatic Switch Co., Orange, N. J.
Binks Mfg. Co., Chicago, Ill.
Centrifix Corp., Cleveland, O.
Clark Mfg. Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Crane Co., Chicago, Ill.
DeVilbiss Co., The, Toledo, O.
Dollinger Corp., Rochester, N. Y.
Dunham Co., C. A., Chicago, Ill.
Gray Co., Inc., Minneapolis, Minn.
Hagan Corp., Pittsburgh, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Corp., Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Chicago, Ill.
Kraissl Co., Inc., The, Hackensack, N. J.
Leavitt Machine Co., Orange, Mass.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Quality Specialty Co., Inc., Camden, N. J.
Spencer Turbine Co., Hartford, Conn.
Spray Engineering Co., Somerville, Mass.
Strong, Carlisle & Hammond Co., Cleveland.
Swartwout Co., The, Cleveland, O.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Vortox Co., Claremont, Calif.
Watts Regulator Co., Lawrence, Mass.
Wright-Austin Co., Detroit, Mich.

SEPARATORS, BLOWDOWN
Wilson Engineering Corp., Chicago, Ill.

SEPARATORS, FLANGE
Kraissl Co., Inc., The, Hackensack, N. J.
Williams & Co., J. H., Buffalo, N. Y.

SEPARATORS, OIL
ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Acme Industries, Inc., Jackson, Mich.
Adams Co., Inc., R. P., Buffalo, N. Y.
Air-Maze Corp., Cleveland, O.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Anderson Co., V. D., The, Cleveland, O.
Armstrong Co., Richard M., Westchester, Pa.
Boylston Steam Specialty Co., Chicago, Ill.
Centrifix Corp., Cleveland, O. (Gas and Vapor)
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crane Co., Chicago, Ill.
Fisher Governor Co., Marshalltown, Ia.
Graver Water Conditioning Co., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hoppes Mfg. Co., Inc., Springfield, O.
Howe Ice Machine Co., Chicago, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Corp., The, Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
Kieley & Mueller, Inc., Middletown, N. Y.
King Zeero Co., The, Chicago, Ill.
Kraissl Co., Inc., The, Hackensack, N. J.
Morehead Mfg. Co., Detroit, Mich.
National Valve & Mfg. Co., Pittsburgh, Pa.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Richmond Engineering Co., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond Co., Cleveland, O.
Swartwout Co., The, Cleveland, O.
Techniflex Corp., Port Jervis, N. Y.
Temprite Products Corp., Birmingham, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
Wright-Austin Co., Detroit, Mich.
York Corp., York, Pa.

SETS, PIPE BIT, FOR BORING HOLES IN WOOD FOR PIPE AND TUBING
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.

SEWAGE EJECTORS
See Ejectors, Sewage

SEWAGE PUMPS
See Pumps, Sewage

SHAFT SEALS, MECHANICAL
See Seals, Shaft, Mechanical

SHAFTS, FLEXIBLE, PUSH-PULL, FOR CONTROL

Anderson & Co., Inc., Sioux City, Ia.
Arens Controls, Inc., Evanston, Ill.
Healey Co., Lee, Glendale, Calif.
Imperial Brass Mfg. Co., Chicago, Ill.
Piezo Mfg. Corp., Staten Island, N. Y.
Teleflex Incorporated, North Wales, Pa.

SHEARS, ELECTRICAL, PORTABLE

Black & Decker Mfg. Co., Towson, Md.
M-M-A, Inc., Lancaster, Pa.
Mall Tool Co., Chicago, Ill.
Miller Falls Co., Greenfield, Mass.
Porter-Cable Machine Co., Syracuse, N. Y.
Skil Corp., Chicago, Ill.
Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Thor Power Tool Co., Aurora, Ill.

SHEARS, POWER

Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bertsch & Co., Inc., Cambridge City, Ind.
Beverly Shear Mfg. Co., Chicago, Ill.
Bliss Co., E. W., Detroit, Mich.
Buckeye Tools Corp., Dayton, O.
Buffalo Forge Co., Buffalo, N. Y.
Cincinnati Shaper Co., Cincinnati, O.
Cleveland Crane & Eng. Co., Wickliffe, O.
Cleveland Punch & Shear Works Co., Cleveland, O.
Diamond Machine Tool Co., Pico, Calif.
Famco Machine Co., Kenosha, Wis.
H-A Mfg. Co., York, Pa.
Hendley & Whittemore, Beloit, Wis.
Kling Bros. Engineering Works, Chicago, Ill.
Libert Machine Co., Green Bay, Wis.
Mall Tool Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Quickwork Div., Whiting Corp., Harvey, Ill.
St. Louis Tool Co., St. Louis, Mo.
Stamco Inc., New Bremen, Ohio
Whiting Corp., Harvey, Ill.
Whitney Metal Tool Co., Rockford, Ill.
Wysong & Miles Inc., Greensboro, N. C.

SHEARS AND SNIPS, HAND

Barlett Mfg. Co., Detroit, Mich.
Beverly Shear Mfg. Co., Chicago, Ill.
Black & Decker Mfg. Co., Towson, Md. (electrically driven)
Bremil Mfg. Co., Erie, Pa.
Champion Blower & Forge Co., Lancaster, Pa.
Clauss Cutlery Co., Fremont, O.
Crescent Tool Co., Jamestown, N. Y.
Kidder Mfg. Co., Inc., J. F. Burlington, Vt. (Angle)
Klenk's Aviation Snips, Wilmington, Del.
Niagara Machine & Tool Wks., Buffalo.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Snap-on Tools Corp., Kenosha, Wis.
Thor Tool & Die Co., San Leandro, Calif.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.
Wiss & Sons Co., J., Newark, N. J.

SHEAVES

See Pulleys and Sheaves, for Belt Drives

SHEET METAL BRAKES

See Brakes, Sheet Metal

SHEET METAL DUCTS

See Ducts and Duct Fittings, Prefabricated Non-Flexible

SHEET METAL FITTINGS

See Ducts and Duct Fittings, Prefabricated Non-Flexible

SHEET METAL PUNCHES

See Punches, Sheet Metal

SHEETS, ALUMINUM

Aluminum Co. of America, Pittsburgh, Pa.
American Nickeloid Co., Peru, Ill. (Nickel and chromium plated)
Brass & Copper Imports, Inc., New York, N. Y.
Central Steel & Wire Co., Chicago, Ill.
Fairmont Aluminum Co., Fairmont, W. Va.
Hunter Mfg. Co., Bristol, Pa. (for pipe covering)
Kaiser Aluminum & Chemical Corp., Oakland, Calif.
Mueller Brass Co., Port Huron, Mich.
Revere Copper and Brass Inc., New York.
Reynolds Metals Co., Louisville, Ky.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, ALUMINUM COATED

Armco Steel Corp., Middletown, O.
Brass & Copper Imports, Inc., New York, N. Y.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS AND BOARD, NON-METALLIC (OTHER THAN PLASTIC), FOR DUCT CONSTRUCTION

Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Celotex Corp., The, Chicago, Ill.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Keystone Asphalt Products Co., Chicago, Ill.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Ruberoid Co., New York, N. Y.
Sall Mountain Co., Hamilton, O.
Technical Ply-Wood Sales, Chicago, Ill.

SHEETS, CLAD

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
Aluminum Co. of America, Pittsburgh, Pa.
American Nickeloid Co., Peru, Ill.
Bart Mfg. Corp., Belleville, N. J.
Bridgeport Brass Co., Bridgeport, Conn. (laminates)
Central Steel & Wire Co., Chicago, Ill. (aluminum)
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill. (stainless)
Jessop Steel Co., Washington, Pa.
Lukens Steel Co. and Divisions, Coatsville, Pa.
Republic Steel Corp., Cleveland, O.
Revere Copper & Brass, Inc., New York.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, COPPER

American Brass Co., Waterbury, Conn.
American Nickeloid Co., Peru, Ill. (Nickel and chromium plated)
Brass & Copper Imports, Inc., New York, N. Y.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Hussey & Co., C. G., Div. Copper Range Co., Pittsburgh, Pa.
Inland Steel Products Co., Milwaukee, Wis.
New Haven Copper Co., The, Seymour, Conn.
Olin Mathieson Chemical Corp., Metals Div., New York, N. Y. (Brass, bronze, super X, phosphor bronze)
Revere Copper & Brass, Inc., New York.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, LEAD

Alpha Metals, Inc., Jersey City, N. J.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City.
Gardiner Metal Co., Chicago, Ill.
Illinois Zinc Co., Chicago, Ill.
National Lead Co., New York, N. Y.
Northwest Lead Co., Seattle, Wash.
Rochester Lead Wks., Rochester, N. Y.
Standard Rolling Mills, Inc., Brooklyn, N. Y.
Weirton Steel Co., Weirton, W. Va. (Alloy coated)

SHEETS, MAGNESIUM ALLOY

Dow Chemical Co., The, Midland, Mich.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, METAL, WITH PROTECTIVE NON-METALLIC COATING

American Nickeloid Co., Peru, Ill.
American Steel Band Co., Pittsburgh, Pa.
Brass & Copper Imports, Inc., New York, N. Y.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Cheney Flashing Co., Trenton, N. J.
Plasteel Products Corp., Washington, Pa.
Rigidized Metals Corp., Buffalo, N. Y.
Robertson Co., H. H., Pittsburgh, Pa.
Technical Ply-Wood Sales, Chicago, Ill. (Metal and plywood)

SHEETS, NICKEL AND NICKEL ALLOY

American Nickeloid Co., Peru, Ill.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
International Nickel Co., Inc., The, New York, N. Y.
Lukens Steel Co. and Divisions, Coatesville, Pa.
Olin Mathieson Chemical Corp., Metals Div., New York, N. Y. (super x)
Revere Copper and Brass, Incorporated, New York, N. Y.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, PLASTIC, FOR DUCTS AND HOODS

Bakelite Co., Div. of Union Carbide & Carbon Chemical Co., New York, N. Y.
Campco Div., Chicago Molded Products Corp., Chicago, Ill.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Colonial Plastics Mfg. Co., Cleveland, O. (Polyvinyl chloride)
Corite Products, Inc., Chicago, Ill.
Formica Co., Cincinnati, O.
Hartwell & Son, Inc., H. N., Boston, Mass. (PVC)
Hooker Electrochemical Co., Niagara Falls, N. Y.
Industrial Products Div., B. F. Goodrich Rubber Co., Marietta, O.
Kaykor Industries, Inc., Yardville, N. J.
Naugatuck Chemical Div., United States Rubber Co., Naugatuck, Conn.
Reflin Co., San Diego, Calif. (Reinforced with glass fibers)
Seelye Craftsman, Minneapolis, Minn.
Seiberling Rubber Co., Plastics Div., Newcomberstown, O.

SHEETS, STEEL, COPPER BEARING

Alan Wood Steel Co., Conshohocken, Pa.
Armco Steel Corp., Middletown, O.
Berger Div., Republic Steel Corp., Canton, O.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel & Wire Co., Chicago, Ill.
Columbia-Geneva Steel (Div. United States Steel Corp.), San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Granite City Steel Co., Granite City, Ill.
Great Western Steel Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Lukens Steel Co. and Divisions, Coatesville, Pa.
Newport Steel Corp., Newport, Ky.
Reeves Steel & Mfg. Co., Dover, O.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal, Iron & Railroad Co., United States Steel Corp., Subsidiary, Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, STEEL, GALVANIZED

Armco Steel Corp., Middletown, O.
Berger Div., Republic Steel Corp., Canton, O.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel & Wire Co., Chicago, Ill.
Columbia-Geneva (Div. United States Steel Corp.), San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Great Western Steel Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Newport Steel Corp., Newport, Ky.
Reeves Steel & Mfg. Co., Dover, O.

Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Ryerson & Son. Inc., Joseph T., Chicago, Ill.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.

SHEETS, STEEL, GALVANNEALED

American Agile Corp., Bedford, O. (sheets plastic)
Berger Div., Republic Steel Corp., Canton, O.
Continental Steel Corp., Kokomo, Ind.
Columbia-Geneva Steel, (Div. United States Steel Corp.), San Francisco, Calif.
Great Western Steel Co., Chicago, Ill.
Newport Steel Corp., Newport, Ky.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sharon Steel Corp., Sharon, Pa.
United States Steel Corp., Pittsburgh, Pa.

SHEETS, STEEL, STAINLESS

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
American Nickeloid Co., Peru, Ill.
Armco Steel Corp., Middletown, O.
Berger Div., Republic Steel Corp., Canton, O.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Duriron Co., Inc., The, Dayton, O.
Eastern Stainless Steel Corp., Baltimore, Md.
Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill.
Jessop Steel Co., Washington, Pa.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal, Iron & Railroad Co., United States Steel Corp., Subsidiary, Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Washington Steel Corp., Washington, Pa.

SHEETS, WROUGHT IRON

Byers Co., A. M., Pittsburgh, Pa.

SHEETS, ZINC

American Nickeloid Co., Peru, Ill. (Nickel and chromium plated)
American Zinc Products Div., Ball Brothers Co., Greencastle, Ind.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Division Lead Co., Summit, Ill.
Illinois Zinc Co., Chicago, Ill.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
New Jersey Zinc Sales Co., New York, N. Y.
Rigidized Metals Corp., Buffalo, N. Y.

SHIELDS, CORROSION, FOR PIPE JOINTS

Atlas Mineral Products Co., Mertztown, Pa.

SHIELDS, VALVE BONNET

Wilmington Plastics Co., Wilmington, Del.

SHOCK ABSORBERS, LIQUID

See Absorbers, Shock, Liquid

SHUTTERS

See Louvers and Shutters

SIGHT GLASSES

See Glasses, Sight, for Pipe Lines

SIGNALS, LIQUID LEVEL

See Alarms, Liquid Level

SIGNALS, TANK FILL

See Alarms, Liquid Level

SILENCERS FOR REDUCING COMPRESSOR INTAKE NOISE

Air-Maze Corp., Cleveland, O.
Dollinger Corp., Rochester, N. Y.

SLEEVE BEARINGS

See Bearings, Sleeve

SLEEVES, PIPE REPAIR

See Clamps, Pipe Repair

SLIME AND ALGAE CONTROL, WATER TREATMENT FOR

See Treatment, Water, for Slime and Algae Control

SMOKE ALARMS

See Alarms, Smoke

SMOKE ELIMINATORS

See Jets, Overfire Air, for Smoke Abatement

SMOKE GUNS

See Guns, Pots and Candles, Smoke and Smudge

SMUDGE POTS

See Guns, Pots and Candles, Smoke and Smudge

SNOW MELTING ANTI-FREEZE

See Compounds, Anti-Freeze

SOFTENERS, WATER

Alrose Chemical Co., Providence, R. I.
American Water Softener Co., Philadelphia.
American Well Works, Aurora, Ill.
Anderson-Stolz Corp., Kansas City., Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Bruner Corp., Milwaukee, Wis.
Chemical Engineering Co., Dallas, Tex.
Cochrane Corp., Philadelphia, Pa.
Culligan Inc., Northbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Duro Co., Dayton, O.
Elgin Softener Corp., Elgin, Ill.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York.
Hungerford & Terry, Inc., Clayton, N. J.
Illinois Water Treatment Co., Rockford, Ill.
Modern-Woodmanse Sales Div., West Chicago, Ill.
Myers & Bro. Co., F. E., The, Ashland, O.
Norwood Associated Engineers Inc., Springfield, Mass.
Oakite Products, Inc., New York, N. Y.
Permutit Co., New York, N. Y.
Reynolds Shaffer Co., Detroit, Mich.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Stover Water Softener Co., St. Charles, Ill.
Uniflow Mfg. Co., Erie, Pa.

SOLAR HEAT RESISTING LOUVERS AND SCREENS

See Louvers, Sun Reflecting; and Screens, Sun Reflecting

SOLDER (SILVER), BRAZING ALLOYS, AND FLUXES

Air-Reduction Sales Co., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allen Co., Inc., L. B., Chicago, Ill.
Alpha Metals, Inc., Jersey City, N. J.
American Brass Co., Waterbury, Conn.
American Platinum Works, Newark, N. J.
Baker & Co., Inc., Newark, N. J.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Handy & Harman, New York, N. Y.
Industrial Service Laboratories, Milwaukee.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif.
Mueller Brass Co., Port Huron, Mich.
National Cylinder Gas Co., Chicago, Ill.
Oxygen Equipment & Service Co., Chicago.
Rotometals, San Francisco, Calif.
Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., Ossining, N. Y.
Stainless Processing Div., Wall Colmonoy Corp., Detroit, Mich.
Sulflo, Inc., Elizabeth, N. J.
Wabash Corp., Chicago, Ill.
Weldit, Inc., Detroit, Mich.

SOLDER (TIN-LEAD), AND FLUXES

Allen Co., Inc., L. B., Chicago, Ill.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Alpha Metals, Inc., Jersey City, N. J.
American Brass Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
American Solder & Flux Co., Philadelphia, Pa.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Benson Co., Inc., Alex R., Hudson, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Chase Brass & Copper Co., Waterbury, Conn.
Division Lead Co., Summit, Ill.
du Pont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington, Del.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Fluxolder Co., Detroit, Mich. (solder paints)
Gardiner Metal Co., Chicago, Ill.
Hercules Chemical Co., Inc., New York, N. Y.
Industrial Service Laboratories, Milwaukee, Wis.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Johnson Foil Mfg. Co., The, St. Louis, Mo.
Kester Solder Co., Chicago, Ill.
Klauer Mfg. Co., Dubuque, Ia.
Lake Chemical Co., Chicago, Ill.
Lenk Mfg. Co., Boston, Mass.
Liquid Carbonic Corp., Chicago, Ill.
London Chemical Co., Melrose Park, Ill.
Mill-Rose Co., Cleveland, O.
Mueller Brass Co., Port Huron, Mich.
National Lead Co., New York, N. Y.
Northwest Lead Co., Seattle, Wash.
Paul-Lewis Laboratories, Inc., Milwaukee, Wis.
Potts-Farrington Co., Philadelphia, Pa.
Rochester Lead Works, Inc., Rochester, N. Y.
Rotometals, San Francisco, Calif.
Ruby Chemical Co., Columbus, O.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., Ossining, N. Y.
Standard Rolling Mills, Inc., Brooklyn, N. Y.
Sulflo, Inc., Elizabeth, N. J.
United Wire & Supply Corp., Cranston, R. I.
Wolfe-Kote Co., Inc., Sheboygan, Wis.

SOLENOIDS AND SOLENOID COILS

A-P Controls Corp., Milwaukee, Wis.
Allen-Bradley Co., Milwaukee, Wis.
Automatic Switch Co., Orange, N. J.
Birdsell Mfg. Co., Inc., Palo Alto, Calif.
Cook Electric Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Dole Valve Co., The, Chicago, Ill.
Dormeyer Industries, Chicago, Ill.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
Hubbell Corp., Mundelein, Ill.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
Jefferson Electric Co., Bellwood, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Monitor Controller, Rockland, Mass.
National Acme Co., The, Cleveland, O.
Soreng Products Corp., Schiller Park, Ill.
Struthers-Dunn, Inc., Pitman, N. J.
Synchro-Start Products, Inc., Skokie, Ill.
Trombetta Solenoid Corp., Milwaukee, Wis.

SOLENOID VALVES

See Valves, Solenoid

SOLVENT, PENETRANT, FOR LOOSENING THREADED JOINTS

Permatex Co., Inc., Brooklyn, N. Y.
Petroleum Solvents Corp., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sealed Unit Parts Co., Inc., Bronx, N. Y.

SOOT BLOWERS
See Blowers, Soot

SOOT DESTROYERS
See Destroyers, Soot, Chemical

SOUND CONTROL FOR COOLING TOWERS
See Noise Elimination for Cooling Towers

SOUND DEADENING FOR DUCTS
See Insulation, Duct, Sound Deadening

SOUND INDICATORS
See Indicators, Sound Level

SOUND TESTERS FOR LOCATING MECHANICAL TROUBLES
See Testers, Sound

SPARGER NOZZLES
See Nozzles, Sparger, for Tank Heating

SPEED CHANGERS
See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical

SPEED REDUCERS
See Reducers, Speed

SPIRAL PIPE
See Pipe, Spiral, Riveted and Welded

SPOT WELDERS
See Welders, Spot

SPRAY HUMIDIFIERS
See Humidifiers, Direct, Spray Head

SPRAY NOZZLES
See Nozzles, Spray

SPRAY PAINTING BOOTHS
See Booths, Painting, Spray

SPRINKLER HEADS
See Heads, Sprinkler

SPRINKLER SYSTEM CONTROLS
See Controls, Fire Protection Sprinkler System; Valves, Fire Protection Sprinkler System Control

SPRINKLERS FOR FIRE PROTECTION
See Heads, Sprinkler

STACKS AND CHIMNEYS, INDUSTRIAL, PREFABRICATED
Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
American Pipe & Steel Corp., Alhambra, Calif.
Bigelow Co., The, New Haven, Conn.
Chicago Metal Mfg. Co., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Hodge Boiler Wks., East Boston, Mass.
Kellogg Co., M. W., The, New York, N. Y.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Prat-Daniel Corp., South Norwalk, Conn.
Van-Packer Corp., Bettendorf, Ia.

STAINLESS STEEL PIPE
See Pipe, Steel, Stainless

STAINLESS STEEL SHEETS
See Sheets, Steel, Stainless

STANDS, PIPE VISE
American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Capewell Mfg. Co., Hartford, Conn.
Erie Tool Wks., Erie, Pa.
International Forge Co., Chicago, Ill.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Martin & Sons, H. P., Owensboro, Ky.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Cleveland, O.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Talon Tools, Inc., North Arlington, N. J.
Western Wire Products Co., St. Louis, Mo.
Williams & Co., J. H., Buffalo, N. Y.

STANDS, TANK
Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
American Pipe & Steel Corp., Alhambra, Calif.
California Steel Products Div., Richmond, Calif.
Columbian Steel Tank Co., Kansas City, Mo.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.

STAPLES FOR FASTENING TUBING
See Hangers and Supports, Pipe

STARTERS, MOTOR
See Controllers and Starters, Motor

STEAM BOOSTER COMPRESSORS
See Compressors, Steam Booster

STEAM ENGINES
See Engines, Steam

STEAM GENERATORS
See Boilers

STEAM JET HEATERS
See Heaters, Steam Jet, for Liquids

STEAM JET REFRIGERATION
See Compressors, Refrigerating, Steam Jet

STEAM PRESSURE REGULATORS
See Valves, Pressure Reducing and Regulating

STEAM PUMPS
See Pumps, Steam

STEAM SEPARATORS
See Separators, Steam and Oil

STEAM TRAPS
See Traps, Steam

STEEL PIPE
See Pipe, Steel

STEEL TUBE FITTINGS, FLARED
See Fittings, Steel Tube, Flared

STEEL TUBING
See Tubing, Steel

STEEL UNIONS
See Unions, Steel

STEEL VALVES
See Valves, Gate; and Valves, Globe

STERILIZING LAMPS
See Lamps, Sterlizing, for Duct Installation

STERILIZING UNITS
See Units, Sterilizing, Air

STOCKS AND DIES
American Pipe Tool Co., Chicago, Ill.
Armstrong Mfg. Co., Bridgeport, Conn.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Crown Die & Tool Corp., Chicago, Ill. (Pipe)
Erie Tool Wks., Erie, Pa.
Greenfield Tap & Die Corp., Greenfield, Mass.
Hollands Mfg. Co., Erie, Pa.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Cleveland, O.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Teleflex Incorporated, North Wales, Pa.
Threadwell Tap & Die Co., Greenfield, Mass.
Toledo Pipe Threading Machine Co., Toledo, O.

STOKERS, INDUSTRIAL AND COMMERCIAL
61 to 1200 Lb per Hr

Allington & Curtis Mfg. Co., Saginaw, Mich. (For shavings, chips and sawdust)
American Coal Burner and Wood Stoker Corp., Chicago, Ill.
American Engineering Co., Philadelphia, Pa. (underfeed, spreader)
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Automatic Firing Corp., St. Louis, Mo.
Babcock & Wilcox Co., New York, N. Y.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Canton Stoker Corp., Canton, O.
Carnes, Inc., John R., Lima, O.
Carpenter Heating & Stoker Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Dayton Automatic Stoker Co., Dayton, O.
Detroit Stoker Co., Detroit, Mich.
Electric Furnace-Man, Inc., Emmaus, Pa.
Erie City Iron Works, Erie, Pa.
Flynn & Emrich Co., Baltimore, Md.
Frederick Iron & Steel Inc., Frederick, Md.
Freeman Heating Div., Illinois Iron & Bolt Co., Carpentersville, Ill.
Gross-Aire Mfg. Co., Overland, Mo.
Heating Assurance, Inc., Spokane, Wash.
Hershey Motorstoker, Inc., Manheim, Pa. (anthracite)
Hoffman Combustion Engrg. Co., Detroit, Mich. (spreader type)
Iron Fireman Mfg. Co., Cleveland, O. (underfeed)
Johnston & Jennings Co., Cleveland, O. (chain grate)
Kol-Master Corp., Oregon, Ill.
Laclede Stoker Co., St. Louis, Mo. (chain grate, spreader)
Leffel & Co., James, Springfield, O.
Mallory Sales Co., Dolton, Ill.
Meyer Furnace Co., The, Peoria, Ill.
Muncie Gear Wks., Inc., Muncie, Ind.
Newcomb-Detroit Co., Detroit, Mich.
Ormsby-Osterman, Inc., St. Louis, Mo.
Perfection Grate & Stoker Co., Springfield, Mass.
Rheem Mfg. Co., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Steel Products Engineering Co., Springfield, O.
Stewart-Warner Corp., U.S. Machine Div., Lebanon, Ind.
Sun-Fire Stoker Corp., New Albany, Ind. (Hopper and bin feed)
V. & E. Products, Inc., Schuylkill Haven, Pa.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whiting Fire Power Products Corp., Superior, Wis.
Whitty Co., Inc., Boston, Mass. (Bituminous)
Will-Burt Co., The, Orrville, O.

STONEWARE PIPE
See Pipe, Stoneware

STORAGE WATER HEATERS
See Heaters, Water, Steam, Storage

STRAINERS, PIPE LINE
A-P Controls Corp., Milwaukee, Wis.
Air Maze Corp., Cleveland, O.
Alco Valve Co., St. Louis, Mo.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Andale Co., Philadelphia, Pa.
Anderson Co., V. D., The, Cleveland, O.
Armstrong Machine Wks., Three Rivers, Mich.
Automatic Switch Co., Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barnes & Jones, Inc., Boston, Mass. (steam and water only)
Barrett, Haentjens & Co., Hazleton, Pa.
Blackmer Pump Co., Grand Rapids, Mich.
Boylston Steam Specialty Co., Chicago, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cashin Co., W. D., Boston, Mass.
Clark Mfg. Co., Cleveland, O.
Coen Co., San Francisco, Calif.
Crane Co., Chicago, Ill.
Cuno Engineering Corp., Meriden, Conn.
Davis Regulator Co., Chicago, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
De Zurik Shower Co., Sartell, Minn.

Eddington Metal Specialty Co., Eddington, Pa.
Edward Valves, Inc., East Chicago, Ind.
Elliott Co., Jeannette, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Newark, N. J.
General Ceramics Corp., Keasbey, N. J. (ceramic)
General Controls Co., Glendale, Calif. and Skokie, Ill.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Granberg Corp., Oakland, Calif.
Hauck Mfg. Co., Brooklyn, N. Y.
Hays Mfg. Co., Erie, Pa.
Henry Valve Co., Melrose Park, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kaye & McDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y.
Leslie Co., Lyndhurst, N. J.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Morrison Brothers Co., Dubuque, Ia.
Mueller Brass Co., Port Huron, Mich.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Long Island City, N. Y.
Newark Wire Cloth Co., Newark, N. J.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
OPW Corp., Cincinnati, O.
Perfecting Service Co., Charlotte, N. C.
Phillips & Co., H. A., Chicago, Ill.
Pittsfield Products, Inc., Ann Arbor, Mich. (wire cloth)
Preferred Utilities Mfg. Corp., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Roylyn, Inc., Glendale, Calif.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Self Cleaning Strainer Co., Oak Lawn, Ill.
Sheffler-Gross Co., Philadelphia, Pa.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Standard Machine & Mfg. Co., St. Louis, Mo.
Staples & Pfeiffer, San Francisco, Calif.
Sterling, Inc., Milwaukee, Wis.
Strong, Carlisle & Hammond Co., Cleveland, O.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc. Westfield, Mass.
Walworth Co., New York, N. Y.
Warren Engineering Co., Broadway, N. J.
Water Cooling Corp., New York, N. Y.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
Winslow Engineering Co., Oakland, Calif.
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.
Zurn Mfg. Co., J. A., Industrial Div., Erie, Pa.

STRAINERS, REFRIGERANT, LIQUID LINE

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Detsch, Gesswein & Neuert, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Madden Brass Products Co., Aurora, Ill.
McIntire Co., The, Livingston, N. J.
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Pittsfield Products, Inc., Ann Arbor, Mich. (wire cloth)
Penn Controls, Inc., Goshen, Ind.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Self Cleaning Strainer Co., Oak Lawn, Ill.
Shank Co., Cyrus, Chicago, Ill.
Standard Machine & Mfg. Co., St. Louis, Mo.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Wabash Corp., Chicago, Ill.

STRAINERS, SUCTION, FOR AIR WASHERS

Bahnson Co., Winston-Salem, N. C.
Eddington Metal Specialty Co., Eddington, Pa.
Keckley Co., O. C., Skokie, Ill.
Newark Wire Cloth Co., Newark, N. J.
Staples & Pfeiffer, San Francisco, Calif.
Water Cooling Corp., New York, N. Y.

STRESS RELIEVERS

See Preheaters and Stress Relievers, Electric, for Pipe Welds

STRIP HEATERS

See Heaters, Strip and Immersion, Electric

STRUCTURAL SHAPES

See Angles, Bars, Beams, Channels and Tees

STUD DRIVERS

See Fasteners, Powder Operated

STUD WELDERS

See Welders, Stud

SUCTION LINE HEAT EXCHANGERS

See Exchangers, Heat, Refrigerant Suction Line

SUMP PUMPS

See Pumps, Sump

SUPERHEATERS, PROCESS STEAM

Alstrom Corp., New York, N. Y.
Babcock & Wilcox Co., New York, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Combustion Engineering, Inc., New York, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Edge Moor Iron Works, Inc., Edge Moor, Del.
Electro-Therm, Inc., Silver Spring, Md.
Foster Wheeler Corp., New York, N. Y.
General Heaters & Regulators Co., East Chicago, Ind.
Murray Iron Wks. Co., Burlington, Ia.
Springfield Boiler Co., Springfield, Ill.
Tranter Mfg. Inc., Lansing, Mich.
Union Iron Works, Erie, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

SURFACE, FINNED, COOLING, BRINE

Aerofin Corp., Syracuse, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Blower Corp., Detroit, Mich.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Doyle & Roth Mfg. Co, Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Subsidiary of National U. S. Radiator Corp., Los Angeles, Calif.
Edwards Engineering Corp., Pompton Plains, N. J.
G. & O. Mfg. Co., New Haven, Conn.
Griscom-Russell Co., The, Massillon, O.
Heat-Exchangers, Inc., Chicago, Ill.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Murray Mfg. Co., D. J., Wausau, Wis.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products, Inc., Minneapolis, Minn.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Detroit, Mich.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, COOLING, COLD WATER

Aerofin Corp., Syracuse, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Blower Corp., Detroit, Mich.
Bayley Blower Co., Milwaukee, Wis.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Edwards Engineering Corp., Pompton Plains, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Halstead & Mitchell, Pittsburgh, Pa.
Hastings Air Control, Inc., Omaha, Nebr.
Heat-Exchangers, Inc., Chicago, Ill.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products, Inc., Minneapolis, Minn.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, COOLING, DIRECT EXPANSION

Aerofin Corp., Syracuse, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Blower Corp., Detroit, Mich.
Bayley Blower Co., Milwaukee, Wis.
Betz Corp., Hammond, Ind.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.

Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Edwards Engineering Corp., Pompton Plains, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Halstead & Mitchell, Pittsburgh, Pa.
Hastings Air Control, Inc., Omaha, Nebr.
Heat-Exchangers, Inc., Chicago, Ill.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Howe Ice Machine Co., Chicago, Ill.
Kennard Corp., St. Louis, Mo.
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Refrigeration Appliances Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products, Inc., Minneapolis, Minn.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Tubenfin Coil Co., Houston, Tex.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United Electric Co., Wichita Falls, Tex.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, HEATING AND COOLING, PRE-ASSEMBLED, INCLUDING COILS, ELIMINATOR PLATES, SETTLING TANK, AND CASING

Clarage Fan Co., Kalamazoo, Mich.
Edwards Engineering Corp., Pompton Plains, N. J.
Rome-Turney Radiator Co., Rome, N. Y.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.

SURFACE, FINNED, HEATING, INDIRECT, FERROUS

Bayley Blower Co., Milwaukee, Wis.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Edwards Engineering Corp., Pompton Plains, N. J.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
Griscom-Russell Co., The, Massillon, O.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
Modine Mfg. Co., Racine, Wis.
Moore Dry-Kiln Co., Jacksonville, Fla.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
New York Blower Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.
Rigidbilt Inc., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products Inc., Minneapolis, Minn.
Spi-Rol-Fin Corp., Pequannock, N. J.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

SURFACE, FINNED, HEATING, INDIRECT, NON-FERROUS

Aerofin Corp., Syracuse, N. Y.
American Blower Corp., Detroit, Mich.
Bayley Blower Co., Milwaukee, Wis.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Edwards Engineering Corp., Pompton Plains, N. J.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Hastings Air Control, Inc., Omaha, Neb.
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X, Inc., Brewster, N. Y.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lewis & Co., Joseph E., Baltimore, Md.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products Inc., Minneapolis, Minn.
Spi-Rol-Fin Corp., Pequannock, N. J.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Tubenfin Coil Co., Houston, Tex.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE THERMOSTATS

See Thermostats, Surface

SUSPENDED FURNACES

See Heaters, Air

SWING JOINTS

See Joints, Pipe, Flexible Swing and Revolving

SWITCHES, ELECTRICAL

Acro Mfg. Co., The, Columbus, O.
Adam Electric Co., Frank, St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Automatic Switch Co., Orange, N. J.
Barber-Colman Co., Rockford, Ill.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Clark Controller Co., Cleveland, O.
Crise Mfg. Co., The, Columbus, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., St. Louis, Mo.
Ebert Electronics Corp., Queens Village, N. Y.
Electric Controller & Mfg Co., Cleveland, O.
Essex Wire Corp., Ft. Wayne, Ind.
Ferro Electric Products, Inc., Kirkland, Ill.
Furnas Electric Co., Batavia, Ill.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Goodwill Mfg. Co., Chicago, Ill.
Guardian Electric Mfg. Co., Chicago, Ill.
Hart Mfg. Co., Hartford, Conn.
Industrial Products Co., Philadelphia, Pa.
Kulka Electric Mfg. Co., Mt. Vernon, N. Y.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
Mallory Co., P. R., Inc., Indianapolis, Ind.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
MicroSwitch Div. of Minneapolis-Honeywell Regulator Co., Freeport, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Monitor Controller, Rockland, Mass.
Morse-Smith-Morse, Inc., Watertown, Mass.
National Acme Co., The, Cleveland, O.
Penn Controls, Inc., Goshen, Ind.
Pyle-National Co., The, Chicago, Ill.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass. (precision)
Square D Co., Detroit, Mich.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Struthers-Dunn, Inc., Pitman, N. J.
Tork Clock Co., Inc., Mount Vernon, N. Y.
Trumbull Components Dept., General Electric Co., Plainville, Conn.
Unimax Switch Div., W. L. Maxson Corp., New York, N. Y.
United Electric Controls Co., Watertown, Mass.
Ward Leonard Electric Co., Mount Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.
Wind-Way Fan & Ventilator Co., New Orleans, La. (fire fuse)
Zenith Electric Co., Chicago, Ill.

SWITCHES, FLOAT, REFRIGERATION

Alco Valve Co., St. Louis, Mo.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Clark Controller Co., Cleveland, O.
Frick Co., Waynesboro, Pa.
Magnetrol, Inc., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Soreng Products Corp., Schiller Park, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.

SWITCHES, FLOW

Cook Electric Co., Chicago, Ill.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Drying Systems, Inc., Chicago, Ill. (air)
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hays Mfg. Co., Erie, Pa.
Magnetrol Inc., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.

SWITCHES, LIQUID LEVEL

Acro Mfg. Co., The, Columbus, O.
Alco Valve Co., St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Automatic Control Co., St. Paul, Minn.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Clark Controller Co., Cleveland, O.
Cook Electric Co., Chicago, Ill.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., St. Louis, Mo.

Detroit Controls Corp., Detroit, Mich.
Electronics Corp. of America, Cambridge, Mass.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Furnas Electric Co., Batavia, Ill.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hays Mfg. Co., Erie, Pa.
Healy Ruff Co., St. Paul, Minn.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Magnetrol Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monitor Controller, Rockland, Mass.
Newark Controls Co., Bloomfield, N. J.
Penn Controls, Inc., Goshen, Ind.
Ripley Co., Inc., Middletown, Conn.
Schaub Engineering Co., Fred H., Chicago, Ill.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Soreng Products Corp., Schiller Park, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Techniflex Corp., Port Jervis, N. Y.
Trimount Instrument Co., Chicago, Ill.
United Electric Controls Co., Watertown, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.

SWITCHES, MERCURY

Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Ebert Electronics Corp., Queens Village, N. Y.
G. M. Mfg. Co., New York, N. Y.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Mercoid Corp., Chicago, Ill.
MicroSwitch Div. of Minneapolis-Honeywell Reg. Co., Freeport, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Newark Controls Co., Bloomfield, N. J.
Westinghouse Electric Corp., Pittsburgh, Pa.

SWITCHES, PNEUMATIC

Automatic Control Co., St. Paul, Minn.
Bristol Co., The, Waterbury, Conn.
Cook Electric Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
United Electric Controls Co., Watertown, Mass.

SWITCHES, PRESSURE AND VACUUM

Allen-Bradley Co., Milwaukee, Wis.
Au-Temp-Co Corp., New York, N. Y.
Automatic Control Co., St. Paul, Minn.
Barksdale Valves, Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Clark Controller Co., Cleveland, O.
Cleveland Fuel Equipment Co., Cleveland, O.
Cook Electric Co., Chicago, Ill.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., St. Louis, Mo.
Detroit Controls Corp., Detroit, Mich.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Furnas Electric Co., Batavia, Ill.
General Controls Corp., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Giannini & Co., Inc., G. M., Pasadena, Calif.
H-B Instrument Co., Philadelphia, Pa.
Healy Ruff Co., St. Paul, Minn.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Leach Relay Co., Los Angeles, Calif.
Longergan Co., J. E., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monitor Controller, Rockland, Mass.
Nason Co., Clarkston, Mich.
Newark Controls Co., Bloomfield, N. J.
Penn Controls, Inc., Goshen, Ind.
Shallcross Controls, Inc., Milwaukee, Wis.
Soreng Products Corp., Schiller Park, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Synchro-Start Products, Inc., Skokie, Ill.
United Electric Controls Co., Watertown, Mass.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.

SWITCHES, TIME

A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J.
Allen-Bradley Co., Milwaukee, Wis.
April Showers Co., Inc., Washington, D. C.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Automatic Electric Mfg. Co., Mankato, Minn.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Clock & Timer Dept., General Electric, Ashland, Mass.
Cramer Co., R. W., Centerbrook, Conn.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Electronics Corp. of America, Cambridge, Mass.
General Controls Corp., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hansen Mfg. Co., Princeton, Ind. (timing motors and time machine)
Haydon Mfg. Co., Inc., Sub. General Time Instruments Corp., Torrington, Conn.
Heat-Timer Corp., New York, N. Y.
Industrial Engineering Corp., Terre Haute, Ind.
International Register Co., Chicago, Ill.
Mallory Co., P. R., The, Indianapolis, Ind.
Mercoid Corp., Chicago, Ill.
Miller-Harris Instrument Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
National Time & Signal Corp., Detroit, Mich.
Paragon Electric Co., Two Rivers, Wis.
Reliance Automatic Lighting Co., Racine, Wis.
Reynolds Electric Co., River Grove, Ill.
Rhodes, Inc., M. H., Hartford, Conn.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Sangamo Electric Co., Springfield, Ill.
Soreng Products Corp., Schiller Park, Ill.
Tork Clock Co., Inc., Mount Vernon, N. Y.
Ward Leonard Electric Co., Mount Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.
Zenith Electric Co., Chicago, Ill.

SWIVEL PIPE COUPLINGS

See Joints, Pipe, Flexible Swing and Revolving

SYSTEMS, COMBUSTION CONTROL

Ace Instrument Co., Inc., Brooklyn, N. Y.
Askania Regulator Co., Chicago, Ill.
Aurora Pump Co., Aurora, Ill.
Bailey Meter Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Bressler Engineering Service, Oregon, Ill.
Bristol Co., Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cash Co., A. W., Decatur, Ill.
Cleveland Fuel Equipment Co., Cleveland, O.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Defender Instrument & Regulator Co., St. Louis, Mo.
De-Tec-Tronic Corp., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electronics Corp. of America, Cambridge, Mass.
Engineer Co., New York, N. Y.
Ess Instrument Co., Bergenfield, N. J.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Dept., Schenectady, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Leahy Mfg. Co., Los Angeles, Calif.
Lientz Co., B. P., Kansas City, Mo.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Republic Flow Meters Co., Chicago, Ill.
Shallcross Controls, Inc., Milwaukee, Wis.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Stout & Sons, David, St. Louis, Mo.
Webster Engineering Co., Tulsa, Okla.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Wing Mfg. Co., L. J., Linden, N. J

SYSTEMS, CONDENSATE RETURN

Acker Organizations, Inc., W. M., Meridian, Miss.
Advance Pump Co., Berkeley, Calif.
Aurora Pump Co., Aurora, Ill.
Barnes & Jones, Inc., Boston, Mass.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Dunham Co., C. A., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Corp., The, Three Rivers, Mich.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Orr & Sembower, Inc., Reading, Pa.
Roth Co., Roy E., Rock Island, Ill.
Sacro Co., Inc., New York, N. Y.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Stout & Sons, David, St. Louis, Mo.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Templeton Bros., Hyde Park, Mass.
York-Shipley, Inc., York, Pa.

SYSTEMS, ELECTRIC PIPE HEATING

Fluid Systems, Inc., New Haven, Conn.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Trent, Inc., Philadelphia, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

SYSTEMS, FIRE EXTINGUISHING, AND HEAT AND SMOKE DETECTORS

Allen Mfg. Co., W. D., Chicago, Ill.
Blaw Knox Co, Power Piping & Sprinkler Div., Pittsburgh, Pa.
C-O-Two Fire Equipment Co., Newark, N. J.
Cardox Corp., Chicago, Ill.
Edison, Inc., Thomas A., West Orange, N. J.
Grinnell Co., Inc., Providence, R. I.
Heat-Timer Corp., New York, N. Y.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Worner Electronic Devices, Rankin, Ill.

SYSTEMS, HEATING, HIGH TEMPERATURE HOT WATER

Over 350 F

American Hydrotherm Corp., Long Island City, N. Y.
Buxton Mfg. Co., Dover, N. J.
International Boiler Works, The, East Stroudsburg, Pa.
Ross Engineering Corp., J. O., New York.

SYSTEMS, HEATING, HOT WATER

Baseline Mfg. Co., Minneapolis, Minn.
Bell & Gossett Co., Morton Grove, Ill.
Beltran Associates, Inc., Brooklyn, N. Y.
Buxton Mfg. Co., Dover, N. J.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
General Heaters & Regulators Co., East Chicago, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kehm Corp., The, Chicago, Ill.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Sullivan Valve & Engineering Co., Butte, Mont.
Taco Heaters, Inc., Providence, R. I.
Thrush & Co., H. A. Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.

SYSTEMS, HEATING, VACUUM

Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

SYSTEMS, HEATING, VAPOR

Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

SYSTEMS, HEATING, ZONE CONTROL

Acro Mfg. Co., The, Columbus, O.
Armstrong Machine Wks., Three Rivers, Mich.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Barnes & Jones, Inc., Boston, Mass.
Bell & Gossett Co., Morton Grove, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Dunham Co., C. A., Chicago, Ill.
General Heaters & Regulators Co., East Chicago, Ind.
Heat-Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O.
Sullivan Valve & Engineering Co., Butte, Mont.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Zone-Heat Regulator Co., Garrettsville, O.

SYSTEMS, HOT GAS DEFROSTING, FOR REFRIGERATION

Bush Mfg. Co., West Hartford, Conn.
Dole Refrigerating Co., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McQuay, Inc., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Tenney Engineering, Inc., Union, N. J.
Vilter Mfg. Co., The, Milwaukee, Wis.

SYSTEMS, PROCESS HEATING, HIGH TEMPERATURE

American Hydrotherm Corp., Long Island City, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Beltran Associates, Inc., Brooklyn, N. Y.
Buxton Mfg. Co., Dover, N. J.
Dow Chemical Co., The, Midland, Mich.
Dravo Corp., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
International Boiler Works, The, East Stroudsburg, Pa.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
Olson & Co., Arthur A., Canfield, O.
Parks-Cramer Co., Fitchburg, Mass.
Peabody Engineering Corp., New York, N. Y.
Ross Engineering Corp., J. O., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Struthers Wells Corp., Titusville, Pa.
Trent, Inc., Philadelphia, Pa.

SYSTEMS, ROOF SPRAYING (FOR COOLING ROOFS)

April Showers Co, Inc., Washington, D. C.
Binks Mfg. Co., Chicago, Ill.
Ross Sprinkler Co., Rosemead, Calif.
Ruppright's Rotary Roof Cooler, Los Angeles, Calif.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.

TABLES, BENDING, PIPE

American Pipe Bending Machine Co., Inc., Poultney, Vt.

TAGS, VALVE, FOR IDENTIFYING VALVES

Chase Brass & Copper Co., Waterbury, Conn.
Meyer & Wenthe, Inc., Chicago, Ill.
Seton Name Plate Co., New Haven, Conn.

TANK FITTINGS

See Fittings and Bushings, Fuel Oil Tank; Alarms, Liquid Level

TANK HEADS

See Parts, for Heating and Air Conditioning Equipment

TANK LININGS

See Coatings, Protective, for Metals

TANKS, BLOWOFF

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
American Pipe & Steel Corp., Alhambra, Calif.
American Water Softener Co., Philadelphia, Pa.
Bigelow Co., The, New Haven, Conn.
Buffalo Tank Corp., Dunellen, N. J.
Bros Boiler & Mfg Co., Wm., Minneapolis, Minn.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc., Chicago, Ill.
Columbian Steel Tank Co., Kansas City, Mo.
Downingtown Iron Works, Downingtown, Pa.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Gabriel Boiler & Fabrication Co., Portland, Ore.
Graver Water Conditioning Co., New York, N. Y.
Hoppes Mfg. Co., Inc., Springfield, O.
International Boiler Works Co., The, East Stroudsburg, Pa.
Koven & Bro., L. O., Inc., Jersey City, N J.
Lucey Boiler & Mfg. Corp., Chattanooga, Ill.
Manitowoc Shipbuilding, Inc, Manitowoc, Wis.
Morrison Brothers Co., Dubuque, Ia.
Murray Iron Wks. Co., Burlington, Ia.
Nooter Corp., St. Louis, Mo.
Norse Boiler Co., Inc, New Market, N. J.
Patterson-Kelley Co., Inc., East Stroudsburg, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Richmond Engineering Co., Richmond, Va.
Union Iron Works, Erie, Pa.

TANKS, EXPANSION, FOR HOT WATER HEATING SYSTEMS

Acme Welding, Div. of the United Tool & Die Co., W. Hartford, Conn.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Baseline Mfg. Co., Minneapolis, Minn.
Bell & Gossett Co., Morton Grove, Ill.
Biggs Boiler Works Co., E. Akron, O.
Birchfield Boiler, Inc., Tacoma, Wash.
Buffalo Tank Corp., Dunellen, N. J.
Caldwell Co., W. E., Louisville, Ky.
Columbian Steel Tank Co., Kansas City, Mo.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Gabriel Boiler & Fabrication Co., Portland, Ore.
General Heaters & Regulators Co., East Chicago, Ind.
Kehm Corp., The, Chicago, Ill.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Morrison Brothers Co., Dubuque, Ia.
National Steel Construction Co., Logansport, Ind.
Norse Boiler Co., Inc., New Market, N. J.
Patterson-Kelley Co., Inc., East Stroudsburg, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Rheem Mfg. Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Scaife Co., Oakmont, Pa.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Western Blower Co., Seattle, Wash.
Wood Co., John, Conshohocken, Pa.

TANKS, PROCESS AND STORAGE

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
Alco Products, Inc., Schenectady, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American Car & Foundry Co., New York, N. Y.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
American Hard Rubber Co., New York, N. Y. (Rubber lined)
American Moistening Co., Providence, R. I.
American Pipe & Steel Corp., Alhambra, Calif.
Armco Drainage & Metal Products, Inc., Middletown, O.
Bell & Gossett Co., Morton Grove, Ill.
Bigelow Co., New Haven, Conn.
Biggs Boiler Wks. Co., E. Akron, O.
Birchfield Boiler, Inc., Tacoma, Wash.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Buffalo Tank Corp., Dunellen, N. J.
Caldwell Co., W. E., Louisville, Ky.
Chicago Bridge & Iron Co., Chicago, Ill.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc., Chicago, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Columbian Steel Tank Co., Kansas City, Mo.

Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Corite Products, Inc., Chicago, Ill. (plastic lined)
Dahlquist Mfg. Co., Div. of Process Engineering Inc., Somerville, Mass.
Day Co, The, Minneapolis, Minn.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Dillon Steam Boiler Wks., Inc., D. M., Fitchburg, Mass.
Downingtown Iron Works, Downingtown, Pa.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Elastic Porcelain Lining Corp., Rochester, N. Y. (Tank linings)
Erie City Iron Wks., Erie, Pa.
Falstrom Co., Passaic, N. J.
Farrar & Trefts, Div. of ADSCO Industries, Buffalo, N. Y.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Frick Co., Waynesboro, Pa.
Gabriel Boiler & Fabrication Co., Portland, Ore.
Gehri Co., Tacoma, Wash.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware & porcelain)
General Fittings Co., East Greenwich, R. I.
Gerstein & Cooper, Inc., South Boston, Mass.
Goodrich Co., B. F., Akron, O. (Rubber lined)
Graver Tank & Mfg. Co., Inc., East Chicago, Ind.
Haveg Corp., Newark, Del.
Heil Process Equipment Corp., Cleveland, Ohio
Hodge Boiler Works, East Boston, Mass.
Hoppes Mfg. Co., Inc., Springfield, O.
International Boiler Wks., The, East Stroudsburg, Pa.
International Engineering, Inc., Dayton, O.
Kaustine Furnace & Tank Corp., Perry, N. Y.
Keller-Northrup, Inc., Dallas, Tex.
Kellog Co., M. W., The, New York, N. Y.
Kirk & Blum Mfg. Co., Cincinnati, O.
Knight, Maurice A., Akron, O. (acid-proof)
Kopperman & Sons, Joseph, Philadelphia.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Littleford Bros. Inc., Cincinnati, O.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Lumm Co., A. H., Toledo, O.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Meldon Industries Div., Tool Industries, Inc., Detroit, Mich.
Mesker Steel Corp., Geo. L., Evansville, Ind.
Morrison Brothers Co., Dubuque, Ia.
Murray Iron Wks. Co., Burlington, Ia.
Newcomb-Detroit Co., Detroit, Mich.
Nooter Corp., St. Louis, Mo.
Norse Boiler Co., Inc., New Market, N. J.
Novelty Steam Boiler Wks., Inc., Baltimore.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa. (glass)
Quaid Fabrications, Inc., Philadelphia, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Rheem Mfg. Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Rosebraugh Co., W. W., Salem, Ore.
Roth Co., Roy E., Rock Island, Ill.
Santa Fe Tank & Tower Co., Inc., Los Angeles, Calif.
Santa Fe Tank & Tower Co. of Texas, Garland, Texas
Scaife Co., Oakmont, Pa.
Sims Co., Erie, Pa.
Struthers Wells Corp., Titusville, Pa.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Tippett & Wood, Phillipsburg, N. J.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Van Noorden Co., E., Boston, Mass.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., Hartford, Conn.
Wood Co., John, Conshohocken, Pa.
Youngstown Welding & Engineering, Youngstown, O.
Zingheim Co., William C., Chicago, Ill.

TAPE, DUCT, ADHESIVE, FOR SEALING JOINTS

Grant Wilson Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
Seamless Rubber Co., The, F. O. S. Industrial Tape Div., New Haven, Conn.

TAPE, INDUSTRIAL, ADHESIVE

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dayton Rubber Co., Dayton, O.
Dearborn Tape & Label Co., Dearborn, Mich.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Durkee-Atwood Co., Minneapolis, Minn.
Gerrard & Co., A. J., Melrose Park, Ill.
Goodrich, B. F., Akron, O.
Johns-Manville, New York, N. Y.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Mystik Adhesive Products Div. of Chicago Show Printing Co., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Polyken Products, Dept. of the Kendall Co., Chicago, Ill.
Products Research Co., Los Angeles, Calif.
Rubber & Plastics Compound Co., New York, N. Y. (vinyl and polyethylene)
Seamless Rubber Co., The, F.O.S. Industrial Tape Div., New Haven, Conn.
United States Rubber Co., New York, N. Y.

TAPS, PIPE

Capewell Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Nye Tool Co., Chicago, Ill.
Threadwell Tap & Die Co., Greenfield, Mass.

TELEVISION, INDUSTRIAL, CLOSED-CIRCUIT

Diamond Power Specialty Corp., Lancaster, O.
Radio Corp. of America, Engineering Products Dept., Camden, N. J.

TEMPERATURE AND HUMIDITY CONTROLS

See Humidistats; Recorder-Controllers; Thermostats

TEMPERATURE RECORDERS

See Recorders, Temperature

TEMPERATURE REGULATORS

See Regulators, Temperature

TEMPLATES, DRAWING, PIPING

Alco Products, Inc., Schenectady, N. Y.
Dietzgen Co., Eugene, Chicago, Ill.
Graphic Indicator Co., Los Angeles, Calif.
Ree Associates, Bogota, N. J. (for marking contour lines on pipe)

TEST CHAMBERS

See Chambers, Test, Controlled Temperature and Humidity

TESTERS, DUST SPOT, FOR AIR FILTERS

Research Appliance Co., Pittsburgh, Pa.
Trerice Co., H. O., Detroit, Mich.

TESTERS, FUEL UNIT

Kingsley Mfg. Co., New Haven, Conn.

TESTERS, GAGE, DEAD WEIGHT

American Instrument Co., Inc., Silver Spring, Md.
Ashton Valve Co., Cambridge, Mass.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green, Cleveland, O.
Trerice Co., H. O., Detroit, Mich.

TESTERS, LEAK, FOR PIPING AND VESSELS

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Gas & Chemical, Inc., New York.
American Pipe & Steel Corp., Alhambra, Calif.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Elvee Co., Melrose, Mass.
Greer Hydraulics, Inc., Jamaica, N. Y.
Johnson-Williams, Inc., Palo Alto, Calif.
Mechanical Products Corp., Chicago, Ill.
Universal Controls Corp., Dallas, Tex.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

TESTERS, MOISTURE

Brabender Corp., Rochelle Park, N. J. (semi-automatic)
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

TESTERS, SOUND, FOR LOCATING MECHANICAL TROUBLES

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Marsh Instrument Co., Skokie, Ill.

TESTERS, SMOKE

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
De-Tec-Tronic Corp., Chicago, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Marsh Instrument Co., Skokie, Ill.
McNeill Smoke Eliminator Co., Chicago, Ill.
Pyrene CO TWO, Newark, N. J.
Research Appliance Co., Pittsburgh, Pa.
Victory Engineering Corp., Union, N. J.

THAWERS, PIPE, ELECTRIC, PORTABLE

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Harold Electric Co., Walla Walla, Wash.
Hobart Bros. Co., Troy, O.
Trindl Products, Ltd., Chicago, Ill.

THERMOMETER WELLS

See Wells, Thermometer

THERMOMETERS, INDICATING, INDUSTRIAL

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Dillon & Co., Inc., W. C., Forest Park, Ill.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Ill.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Moeller Instrument Co., Richmond Hill, N. Y.
Pacific Transducer Corp., Los Angeles, Calif. (for surface temperatures)

Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Co., Skokie, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York.
Rochester Mfg. Co., Rochester, N. Y.
Schaevitz Engineering, Camden, N. J.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of America Machine and Metals, Inc., Sellersville, Pa.
Velan Engineering Co., Montreal, Canada
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

THERMOMETERS, INDICATING, PIPE SURFACE TEMPERATURE

Bristol Co., The, Waterbury, Conn.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Moeller Instrument Co., Richmond Hill, N. Y.
Pacific Transducer Corp., Los Angeles, Calif.

THERMOMETERS, INDICATING, REMOTE-READING

Airguide Instrument Co., Chicago, Ill.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc, Chicago, Ill.
H-B Instrument Co., Philadelphia, Pa.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Moore Products Co., Philadelphia, Pa.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Philadelphia Thermometer Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Rochester Mfg. Co., Rochester N. Y.
Sarco Co., Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thompson Research & Mfg. Co., Davenport, Fla.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

THERMOMETERS, INDICATING, WALL

Airguide Instrument Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., St. Louis, Mo.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Philadelphia Thermometer Co., Philadelphia, Pa.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Sarco Co., Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y. (Effective temperature indicator)
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

THERMOMETERS, KATA

G. M. Mfg. Co., New York, N. Y.
Hill & Co., E. Vernon, Lake Geneva, Wis.

THERMOSTATIC BELLOWS

See Bellows, Thermostatic and Metallic

THERMOSTATIC BI-METALS

See Bi-Metals, Thermostatic

THERMOSTATIC TRAPS

See Traps, Steam, Thermostatic

THERMOSTATS, DUCT TYPE

American District Telegraph Co., New York, N. Y.
Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Burling Instrument Co., Chatham, N. J.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fenwal Inc., Ashland, Mass.
General Controls Co., Glendale, Calif.
Johnson Service Co., Milwaukee, Wis.
Leslie Co., Lyndhurst, N. J.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Moeller Instrument Co., Richmond Hill, N. Y.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Stevens Mfg. Co., Inc., Mansfield, O.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.

THERMOSTATS, EFFECTIVE TEMPERATURE

Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Sarcotherm Controls, Inc., New York, N. Y.

THERMOSTATS, IMMERSION

Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Burling Instrument Co., Chatham, N. J.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Detroit Controls Corp., Detroit, Mich.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fenwal Inc., Ashland, Mass.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
General Controls Co., Glendale, Calif. and Skokie, Ill.
H-B Instrument Co., Phiadelphia, Pa.
Hart Mfg. Co., Hartford, Conn.
Industrial Engineering Corp., Terre Haute, Ind.
Johnson Service Co., Milwaukee, Wis.
Leslie Co., Lyndhurst, N. J.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Philadelphia Thermometer Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Security Valves Corp., Glendale, Calif.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Sullivan Valve & Engineering Co., Butte, Mont.
Thwing-Albert Instrument Co., Philadelphia.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wilcolator Co., Elizabeth, N. J.

THERMOSTATS, RADIANT HEAT

Automatic Devices Co., Inc., Western Springs, Ill.
Crystalheat Co., Van Nuys, Calif.
Detroit Controls Corp., Detroit, Mich.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
White-Rodgers Electric Co., St. Louis, Mo.

THERMOSTATS, ROOM OR WALL

A-P Controls Corp., Milwaukee, Wis.
Acro Mfg. Co., The, Columbus, O.
Armstrong Machine Wks., Three Rivers, Mich.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill .
Barber-Colman Co., Rockford, Ill.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Crown Controls Co., Inc., New Bremen, O.
Crystalheat Co., Van Nuys, Calif.
Detroit Controls Corp., Detroit, Mich.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Industrial Engineering Corp., Terre Haute, Ind.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
McCorkle Co., D. H., Berkeley, Calif.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., The, Chicago, Ill.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.

Roberson Co., L. N., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Soreng Products Corp., Schiller Park, Ill.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Thrush & Co., H. A., Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls. Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Wesix Electric Heater Co., San Francisco.
White-Rodgers Electric Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, SURFACE

Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Detroit Controls Corp., Detroit, Mich.
Fenwal Inc., Ashland, Mass.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hart Mfg. Co., Hartford, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Industrial Engineering Corp., Terre Haute, Ind.
Johnson Service Co., Milwaukee, Wis.
McCorkle Co., D. H., Berkeley, Calif.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Red Spot Electric Co., Tacoma, Wash.
Roberson Co., L. N., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Stevens Mfg. Co., Inc., Mansfield, O.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, TWO TEMPERATURE OR DUAL

Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Burling Instrument Co., Chatham, N. J.
Detroit Controls Corp., Detroit, Mich.
Franklin Dales Co., Akron, O.
General Controls Co., Glendale, Calif. and Skokie, Ill.
H-B Instrument Co., Philadelphia, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Industrial Engineering Corp., Terre Haute, Ind.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
Mercoid Corp., The, Chicago, Ill.
Miller-Harris Instrument Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Roberson Co., L. N., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Soreng Products Corp., Schiller Park, Ill.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
White-Rodgers Electric Co., St. Louis, Mo.

THERMOSTATS, WEATHER COMPENSATING

Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Crown Controls Co., Inc., New Bremen, O.
Detroit Controls Corp., Detroit, Mich.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Heat-Timer Corp., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
McLarty Systems, Battle Creek, Mich.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Tallmadge, Webster, Systems, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
United Electric Controls Co., Watertown, Mass.
White-Rodgers Electric Co., St. Louis, Mo. (Level-Temp)

TIME RECORDER-TOTALIZERS

See Recorder-Totalizers, Time

TIME SWITCHES

See Switches, Time

TOGGLE BOLTS

See Bolts, Toggle and Anchor

TONGS, PIPE

Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Williams & Co., J. H., Buffalo, N. Y.

TOOLS (CHISELS, PLIERS, SCREW DRIVERS, ETC.)

Adre Co., The, Hales Corners, Wis. (burnishers for electrical contacts)
Atkins Saw Div., Borg-Warner Corp., Indianapolis, Ind. (hack saws, files)
Badger Sales Co., Inc., Los Angeles, Calif. (magnifying inspectoscope for inspection of hard-to-get-at places)
Barton Products, Inc., Wheaton, Ill. (flexible shaft grinding wheel and wire brush)
Billings & Spencer Co., Hartford, Conn.
Birks Mfg. Co., Meriden, Conn. (Pittsburgh lock seam opener)
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Boston Machine Works Co., Lynn, Mass. (nozzle extractor)
Carlson & Sullivan, Monrovia, Calif. (steel tape rule for reading diameter)
Crescent Tool Co., Jamestown, N. Y.
Dreier Brothers, Inc., Chicago, Ill. (level for determining pitch of pipe; hack saws)
Duro Metal Products Co., Chicago, Ill.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y. (file handles and solder iron handles, punches)
Erie Tool Wks., Erie, Pa. (Vises, cutter wheels, rollers)
Franklin Balmar Corp., Baltimore 11, Md.
Gel-Me Co., Bloomington, Ill. (electric sound probe for locating mechanical trouble)
Gibson Industries, Inc., Muskegon, Mich. (for closing Pittsburgh lock)
Greene, Tweed & Co., North Wales, Pa.
Greenlee Tool Co., Div. of Greenless Bros. & Co., Rockford, Ill.
Hexdall Co., A. M., Morris, Ill. (Pittsburgh lock hammers, tee hammers, seam openers)
Howes-Wood Co., Cambridge, Mass. (hacksaws, blades, handsaws)
Independent Blade Corp., Joliet, Ill. (plastic cutting & other saw blades)
Ingersoll-Rand Co., New York, N. Y.
Jaco Devices Co., Hingham, Mass. (drill attachment for sawing, etc.)
Lenk Mfg. Co., Boston, Mass. (electric soldering irons)
Levow, David, New York, N. Y. (3 way clamp)
Lufkin Rule Co., Saginaw, Mich. (steel tapes and folding rules)
Matrix Engineering Corp., Minneapolis, Minn. (pneumatically operated nail driver for concrete, wood, sheet metal)
Millers Falls Co., Greenfield, Mass.
Misener Mfg. Co., Inc., Syracuse, N. Y. (hole saws)
Owens Co., H., Culver City, Calif. (pattern developer tool for sheet metal work)
Phillips Drill Co., Michigan City, Ind. (impact hammers)
Pioneer Tool Co., Racine, Wis.
Proto Tool Co., Los Angeles, Calif.
Producers & Distributors, Inc., Allentown, Pa. (hack saw blades for portable power hack saw)
R C S Tool Corp., Joliet, Ill. (reciprocating saw attachment; right angle drill attachments)
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., Cleveland, O. (Powder-actuated tools)
Rawplug Co., Inc., The, New York, N. Y. (drills for masonry)
Refrigeration Devices Co., Nutley, N. J. (oiler for refrigeration compressors)
Reiner & Campbell Co., Inc., Newark, N. J. (Dividers, drive cleat notchers)
Richmont, Inc., Monrovia, Calif.
Rotary Concrete Drill Co., Pasadena, Calif. (Drill bits)
Rotor Tool Co., Cleveland, O.
Salsbury Corp., Los Angeles, Calif. (air hammer)
Scharf Mfg. Co., J. H., Omaha, Nebr. (magnesium levels)
Schild Mfg. Co., Dallas Tex.
Snap-on Tools Corp., Kenosha, Wis.
Stanley Works, The, New Britain, Conn.
Thompson & Son Co., The Henry G., New Haven, Conn.
Wassco Electric Products Corp., Joliet, Ill. (soldering pliers for copper tubing)
Williams & Co., J. H., Buffalo, N. Y.

TOOLS, FLARING, FOR TUBING

Armstrong Bros. Tool Co., Chicago, Ill.
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Capewell Mfg. Co., Hartford, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Duro Metal Products Co., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kent-Moore Organization, Inc., Detroit, Mich.
Key Co., East St. Louis, Ill.
Madden Brass Products Co., Aurora, Ill.
Mueller Co., Decatur, Ill.
Nye Tool Co., Chicago, Ill.
Parker Appliance Co., The, Cleveland, O.
Penn Brass & Copper Co., Erie, Pa.
Research Vacuum Supply Co., Chicago, Ill. (Press gears)
Sac Tool Mfg. Co., St. Louis, Mo.
Schaul Mfg. Co., Cleveland, Ohio
Snap-On Tools Corp., Kenosha, Wis.
Talon Tools, Inc., North Arlington, N. J.
Weatherhead Co., Cleveland, O.
Williams & Co., J. H., Buffalo, N. Y.
Wilson Co., K. R., Arcade, N. Y.
Wilson, Inc., Thomas C., Long Island City, N. Y.

TORCHES, BRAZING SOLDERING AND WELDING

Aeroil Products Co., Inc., South Hackensack, N. J.
Air Reduction Sales Co., New York, N. Y.
Atlas Welding Accessories, Co., Ferndale, Mich.
Bernz Co., Otto, Rochester, N. Y.
Borm Mfg. Co., Elgin, Ill.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Deutsch Co., The, Los Angeles, Calif.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ergolyte Mfg. Co., Philadelphia, Pa.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Goss Gas, Inc., Pittsburgh, Pa.
Harris Calorific Co., The, Cleveland, O.
Ideal Industries, Inc., Sycamore, Ill.
Industrial Gas Div., Liquid Carbonic Corp., Chicago, Ill.
Insto-Gas Corp., Detroit, Mich.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
K-G Equipment Co., Allentown, Pa.
Lee Co., K. O., Aberdeen, S. D.
Lenk Mfg. Co., Boston, Mass.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Liquid Carbonic Corp., The, Chicago, Ill.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Mid-States Welder Mfg. Co., Chicago, Ill.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Modern Engineering Co., St. Louis, Mo.
Mutual Liquid Gas & Equipment Co., Gardena, Calif.
National Cylinder Gas Co., Chicago, Ill.
Polis Mfg. Co., J. D., Chicago, Ill.
Prepo Corp., Edgerton, Wis.

Ransome Co., Emeryville, Calif.
Reiner & Campbell Co., Inc., Newark, N. J.
Research Vacuum Supply Co., Chicago, Ill.
Sac Tool Mfg. Co., St. Louis, Mo.
Seelye Craftsman, Minneapolis, Minn. (for welding plastics)
Selas Corp. of America, Philadelphia, Pa.
Sight Feed Generator Co., West Alexandria, O.
Smith Welding Equipment Corp., Minneapolis, Minn.
Torit Mfg. Co., St. Paul, Minn.
Trindl Products, Ltd., Chicago, Ill.
Turner Brass Works, The, Sycamore, Ill.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich. (for L-P gas)
Will-Weld Mfg. Co., Inc., Omaha, Neb.

TORQUE INDICATING WRENCHES

See Wrenches, Torque Indicating

TOWERS, COOLING, ATMOSPHERIC

American Cooling Tower Co., Kansas City, Mo.
Binks Mfg. Co., Chicago, Ill.
Dover Mfg. Co., Independence, Mo.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Whittier, Calif.
Harry Cooling Towers, Inc., New York, N. Y.
Lilie-Hoffmann Cooling Towers, Inc., St. Louis, Mo.
Marley Co., The, Kansas City, Mo.
Peerless Products Div., United Cooling Towers, Inc., N. Little Rock, Ark.
Pennsylvania Engineering Corp., New Castle, Pa.
Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Pritchard & Co. of California, J. F. Kansas City, Mo.
Santa Fe Tank & Tower Co., Inc., Los Angeles, Calif.
Santa Fe Tank & Tower Co., Garland, Tex.
Stewart Ice Machine Co., Pomona, Calif.
Sun-Fire Stoker Corp., New Albany, Ind.
TOT Towers, Inc., Houston, Tex.
Thermal Agency, Houston, Tex.
Toungate & Coats, Austin, Tex.
United Cooling Tower Co., Kansas City, Mo.
United States Cooling Tower Co., Div. of Heatcraft Co., Louisville, Ky.
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.

TOWERS, COOLING, MECHANICAL DRAFT

Acme Industries, Inc., Jackson, Mich.
Air Purification Service, Inc., New York, N. Y.
Air & Refrigeration Corp., New York, N. Y.
American Cooling Tower Co., Kansas City, Mo.
Aqua-Therm, Inc., Dayton, O.
Ayres, Inc., Houston, Tex.
Baldwin Ward Mfg. Co., Inc., Ottawa, Ks.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Binks Mfg. Co., Chicago, Ill.
Blazer & Son, M., Passaic, N. J.
Buensod-Stacey, Inc., New York, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Deansteel Products Co., San Antonio, Tex.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Dover Mfg. Co., Independence, Mo.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Whittier, Calif.
Foster Wheeler Corp., New York, N. Y.
Goodfellow Co., Inc., E. D., Memphis, Tenn.
Governair Corp., Oklahoma City, Okla.
Halstead & Mitchell, Pittsburgh, Pa.
Harry Cooling Towers, Inc., New York, N. Y.
Havens Structural Steel Co., Cooling Tower Div., Kansas City, Mo.
Keller-Northrup, Inc., Dallas, Tex.
Kennard Corp., St. Louis, Mo.
Knoblock Co., Newport, Ky.
Kramer-Trenton Co., Trenton, N. J.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Larkin Coils, Inc., Atlanta, Ga.
Lilie-Hoffmann Cooling Towers, Inc., St. Louis, Mo.
Marley Co., The, Kansas City, Mo.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Morris Sheet Metal Works, Columbus, O.
Niagara Products Co., Phoenix, Ariz.
Peerless Products Div., United Cooling Towers, Inc., N. Little Rock, Ark.
Pennsylvania Engineering Corp., New Castle, Pa.
Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Pritchard & Co. of California, J. F. Kansas City, Mo.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
S & C Mfg. Co., Cincinnati, O.
Santa Fe Tank & Tower Co. of Texas, Garland, Tex.
Santa Fe Tank & Tower Co., Inc., Los Angeles, Calif.
Schancke, Inc., Evansville, Ind.
Servel, Inc., Evansville, Ind.
Silco Products, Inc., Minneapolis, Minn.
Silvercraft, Inc., Louisville, Ky.
Sun-Fire Stoker Corp., New Albany, Ind.
Tenney Engineering Inc.,Union, N. J.
TOT Towers, Inc., Houston, Tex.
Toungate & Coats, Austin, Tex.
United Cooling Tower Co., Kansas City, Mo.
United States Cooling Tower Co., Div. Heatcraft Co., Louisville, Ky.
United States Air Conditioning Corp., Minneapolis, Minn.
Vogt Machine Co., Henry, Louisville, Ky. (packaged unit with condenser, pump, etc.)
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.
Worthington Corp., Harrison, N. J.

TOWERS, COOLING, NOISE ELIMINATION FOR

See Noise Elimination for Cooling Towers

TRANSFORMERS, ELECTRIC

Acme Electric Corp., Cuba, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Arjac Products Inc., Rochester, N. Y.
Birdsell Mfg. Co., Inc., Palo Alto, Calif.
Central Transformer Corp., Pine Bluff, Ark.
Crown Controls Co., Inc., New Bremen, O.
Dormeyer Industries, Chicago, Ill.
Eisler Engineering Co., Inc., Newark, N. J.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif., and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Jefferson Electric Co., Bellwood, Ill.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Rex Welder Co., Kansas City, Mo.
Schaevitz Engineering, Camden, N. J.
Sola Electric Co., Chicago, Ill. (voltage regulating)
Square D Co. Industrial Controller Div., Milwaukee, Wis.
Taylor-Winfield Corp., Warren, O.
Trindl Products, Ltd., Chicago, Ill.
Union Electric & Mfg. Co., Jersey City, N. J.
Wagner Electric Corp., St. Louis, Mo.
Webster Electric Co., Racine, Wis.
Westinghouse Electric Corp., Pittsburgh, Pa.

TRANSMISSION DRIVES

See Drives, Chain, Flat Belt and V-Belt

TRANSMITTERS, PRESSURE AND TEMPERATURE

Bristol Co., The, Waterbury, Conn.
Control Engineering Corp., Controls Div., Norwood, Mass.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Giannini & Co., Inc., Pasadena, Calif.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.

TRAPS, MAGNETIC, FOR REMOVING TRAMP IRON FROM PIPE LINES

Columbia Engineering Service Co., Santa Rosa, Calif.
Dings Magnetic Separator Co., Milwaukee.
Ladish Co., Tri-Clover Div., Kenosha, Wis.

TRAPS, STEAM, FLOAT-THERMOSTATIC

American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Bailey Co., Chas. M., San Francisco, Calif.
Barnes & Jones, Inc., Jamaica Plain, Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Clifford Mfg. Co., Div. of Standard Thompson Corp., Waltham, Mass.
Cochrane Corp., Philadelphia, Pa.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Davis Regulator Co., Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.
Haines Div., Wm. S., Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trerice Co., H. O., Detroit, Mich.
Vis-A-Plug, Inc., King of Prussia, Pa.
Webster & Co., Warren, Camden, N. J.
Wright-Austin Co., Detroit, Mich.

TRAPS, STEAM, MECHANICAL

Acker Organization, Inc., W. M. Meridian, Miss.
American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Anderson Co., V. D., The, Cleveland, O.
Armstrong Machine Wks., Three Rivers, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Barnes & Jones, Inc., Boston, Mass.
Boylston Steam Specialty Co., Chicago, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Burrows Mfg. Co., F. A., York, Pa.
Cashin Co., W. D., Boston, Mass.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Coe Mfg. Co., Painesville, O.
Crane Co., Chicago, Ill.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Fisher Governor Co., Marshalltown, Ia.
Haines Div., William S., Sellers Injector Corp., Philadelphia, Pa.
Healy Ruff Co., St. Paul, Minn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Corp., The, Three Rivers, Mich.
Justus Steam Trap Co., Napanoch, N. Y.
Kaye & MacDonald, Inc., West Orange, N. J.
Leavitt Machine Co., Orange, Mass.
Marsh Heating Equipment Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
McAuley Trap Co., Pittsburgh, Pa.
Milwaukee Valve Co., Milwaukee, Wis.
Monash-Younker Co., Inc., Chicago, Ill.
Morehead Mfg. Co., Detroit, Mich.
Nason Co., Clarkston, Mich.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Perfecting Service Co., Charlotte, N. C.
Rockwell Co., W. S., Fairfield, Conn.
Sarco Co., Inc., New York, N. Y.
Schaub Engineering Co., Fred H., Chicago, Ill.
Squires Co., C. E., The, Cleveland, O.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Sterling, Inc., Milwaukee, Wis.

Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond Co., Cleveland, O.
Templeton Bros., Hyde Park, Mass.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Vis-A-Plug, Inc., King of Prussia, Pa. (bucket only)
Watson & McDaniel Co., Philadelphia, Pa.
Webster & Co., Warren, Camden, N. J.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.

TRAPS, STEAM, THERMOSTATIC

American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Dunham Co., C. A., Chicago, Ill.
Haines Div., William S., Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Monash-Younker Co., Inc., Chicago, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Sterling, Inc., Milwaukee, Wis.
Templeton Bros., Hyde Park, Mass.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Velan Engineering Co., Montreal, Canada
Webster & Co., Warren, Camden, N. J.

TRAPS, WATER, FOR OIL TANKS

Columbian Steel Tank Co., Kansas City, Mo.
General Filter Co., Ames, Ia.

TREATMENT, FUEL OIL, TO PREVENT SLUDGE

Allen Co., Robert G., Mechanicsville, N. Y.
Alrose Chemical Co., Providence, R. I.
American Sand-Banum Co., Inc., Freeport, N. Y.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Eds-Wil Burner Corp., Chicago, Ill.
Elraco Engineering Co., Los Angeles, Calif.
Hercules Chemical Co., Inc., New York, N. Y.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Monsanto Chemical Co., St. Louis, Mo.
Montgomery Chemical Co., Jenkintown, Pa.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Nutmeg Chemical Co., New Haven, Conn.
Perolin Co., Inc., Chicago, Ill.
Petroleum Solvents Corp., New York, N. Y.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sudbury Laboratory, South Sudbury, Mass.
Warren Refining & Chemical Co., The, Cleveland, O.
Western Chemical Co., Kansas City, Mo.
Winslow Engineering Co., Oakland, Calif.

TREATMENT, STEAM SYSTEM, TO INHIBIT CORROSION

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Water Softener Co., Philadelphia, Pa.
American Well Wks., Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown Electro Co., Oklahoma City, Okla.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Cochrane Corp., Philadelphia, Pa.
Continental Products Co., Euclid, O.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Elgin Softener Corp., Elgin, Ill.
Elraco Engineering Co., Los Angeles, Calif.
Graver Water Conditioning Co., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hercules Chemical Co., Inc., New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Perolin Co., Inc., Chicago, Ill.
Proportioneers, Inc., Div. of B-I-F Industries, Inc. Providence, R. I.
Rid-Sludge Div., Aulwood Mfg. Co., St. Paul, Minn. (vapor treatment to remove sludge from heating system)
Saverite Engineering Co., Hoboken, N. J.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Strong, Carlisle & Hammond Co., Cleveland, O.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Warren Refining & Chemical Co., Cleveland, O.
Water Control Engineering Co., Kansas City, Mo.
Water Treatment Co. of America, Pittsburgh, Pa.
Western Chemical Co., Kansas City, Mo.

TREATMENT, WATER, TO INHIBIT CORROSION

Agava Products, Inc., Jersey City, N. J.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Cyanamid & Chemical Corp., New York, N. Y.
American K. A. T. Corp., Garwood, N. J.
American Sand-Banum Co., Inc., Freeport, N. Y.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown Electro Co., Oklahoma City, Okla.
Calgon, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Cochrane Corp., Philadelphia, Pa.
Culligan Inc., Northbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Electro Mfg. Co., Houston, Tex.
Elgin Softener Corp., Elgin, Ill.
Elraco Engineereing Co., Los Angeles, Calif.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Fischer & Porter Co., Hatboro, Pa.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York, N. Y.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hagan Corp., Pittsburgh, Pa.
Hungerford & Terry, Inc., Clayton, N. J.
Industrial Filter & Pump Co., Chicago, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Layne & Bowler, Inc., Memphis, Tenn.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Maintenance Engineering Corp., Houston, Tex.
McMillan Industrial Supplies, C. C., Portland, Ore.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Monsanto Chemical Co., St. Louis, Mo.
Moreheat Distribution, Inc., Cincinnati, O.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I.
Permutit Co., New York, N. Y.
Perolin Co., Inc., Chicago, Ill.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Reynolds Shaffer Co., Detroit, Mich.
Saverite Engineering Co., Hoboken, N. J.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Strong, Carlisle & Hammond Co., Cleveland, O.
Sudbury Laboratory, South Sudbury, Mass.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Uniflow Mfg. Co., Erie, Pa.
Wallace & Tiernan, Inc., Belleville, N. J.
Water Control Engineering Co., Kansas City, Mo.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Company of America, Pittsburgh, Pa.
Western Chemical Co., Kansas City, Mo.
Worthington Corp., Harrison, N. J.
X Laboratories, Inc., New York, N. Y.

TREATMENT, WATER, TO PREVENT SCALE FORMATION

Agava Products, Inc., Jersey City, N. J.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Sand-Banum Co., Inc., Freeport, N. Y.
American Water Softener Co., Philadelphia.
Anderson Chemical Co., Inc., Macon, Ga.
Aqua Electric Scale Control, Inc., Cleveland, O.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown-Electro Co., Oklahoma City, Okla.
Calgon, Inc., Pittsburgh, Pa.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Cochrane Corp., Philadelphia, Pa.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Elraco Engineering Co., Los Angeles, Calif.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York, N. Y.
Haering & Co., Inc., D. W., San Antonio, Tex.
Heller Laboratories, Leonia, N. J.
Hungerford & Terry, Inc., Clayton, N. J.
Illinois Water Treatment Co., Rockford, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Madden Corp., Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
McMillan Industrial Supplies, C. C., Portland, Ore.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Packard Mfg. Co., P. O. Box 719, Jacksonville, Fla.
Perolin Co., Inc., The, Chicago, Ill.
Permutit Co., New York, N. Y.
Reynolds Shaffer Co., Detroit, Mich.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Uniflow Mfg. Co., Erie, Pa.
Water Service Laboratories, Inc., New York, N. Y.
Winslow Engineering Co., Oakland, Calif.

TREATMENT, WATER, FOR SLIME AND ALGAE CONTROL

Agava Products Inc., Jersey City, N. J.
Alrose Chemical Co., Providence, R. I.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown Electro Co., Oklahoma City, Okla.
Builders Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Calgon, Inc., Pittsburgh, Pa.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Carolina Aniline & Extract Co., Charlotte, N. C.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Dearborn Chemical Co., Chicago, Ill.
Dow Chemical Co., The, Midland, Mich.
Drew & Co., Inc., E. F., New York, N. Y.
Elraco Engineering Co., Los Angeles, Calif.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Fischer & Porter Co., Hatboro, Pa.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York, N. Y.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hagan Corp., Pittsburgh, Pa.
Hall Laboratories, Inc., Pittsburgh, Pa.
Hanovia Chemical & Mfg. Co., Newark, N. J. (ultraviolet)
Hungerford & Terry, Inc., Clayton, N. J.
Layne & Bowler, Inc., Memphis, Tenn.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Monsanto Chemical Co., St. Louis, Mo.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Norwood Associated Engineers, Inc., Springfield, Mass.
Oakite Products, Inc., New York, N. Y.
Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I.
Perolin Co., Inc., Chicago, Ill.
Permutit Co., New York, N. Y.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Solvay Process Div., Allied Chemical & Dye Corp., New York, N. Y.
Steelcote Mfg. Co., St. Louis, Mo.
Wallace & Tiernan, Inc., Belleville, N. J.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Co. of America, Pittsburgh, Pa.
Western Chemical Co., Kansas City, Mo.

TRENCHING MACHINES FOR PIPE LINES

See Machines, Trenching for Pipe Lines

TRUCKS, LIFT

Buda Div., The, Allis-Chalmers Mfg. Co., Harvey, Ill.

TRY-COCKS, BOILER

Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Diamond Power Specialty Corp., Lancaster, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ernst Water Column & Gauge Co., Livingston, N. J.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Skokie, Ill.
New York Air Valve Corp., Brooklyn, N. Y.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Roessing Mfg. Co., Pittsburgh, Pa.
Security Valves Corp., Glendale, Calif.

TUBE CLEANERS

See Cleaners, Tube

TUBE FINNING MACHINES

See Machines, Tube Finning

TUBES, BOILER

Babcock & Wilcox Co., The, Tubular Products Div., Alliance, O.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Brass & Copper Imports, Inc., New York, N. Y.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
H & H Tube & Mfg. Co., Detroit, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis. (stainless)
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Detroit, Mich.

TUBES, CONDENSER

American Brass Co., Waterbury, Conn.
Babcock & Wilcox Co., The, Tubular Products Div., Alliance, O.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Brass & Copper Imports, Inc., New York, N. Y.
Bridgeport Brass Co., Bridgeport, Conn.
Bundy Tubing Co., Detroit, Mich.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Chase Brass & Copper Co., Waterbury, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Edwards Engineering Corp., Pompton Plains, N. J.
Helical Tube Corp., Grand Rapids, Mich.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Phelps Dodge Copper Products Corp., British American Tube Div., New York, N. Y.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Revere Copper and Brass Incorporated, New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Sawhill Tubular Products, Inc., Sharon, Pa.
Scovill Mfg. Co., Waterville Div., Waterville, Conn. (copper base)
Standard Tube Co., Detroit, Mich.
Timken Roller Bearing Co., Canton, O.
Trent Tube Co., East Troy, Wis. (stainless)
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
York Corp., York, Pa.

TUBES, PITOT

Defender Instrument and Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Meriam Instrument Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.

TUBING, ALUMINUM

Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
Brass & Copper Imports, Inc., New York, N. Y.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
H & H Tube & Mfg. Co., Detroit, Mich.
Harvey Aluminum, Torrance, Calif.
Kaiser Aluminum & Chemical Corp., Oakland, Calif.
Penn Brass & Copper Co., Erie, Pa.
Revere Copper and Brass Incorporated, New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Sawhill Tubular Products, Inc., Sharon, Pa.
United Wire & Supply Corp., Cranston, R. I.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
Youngstown Welding & Engineering, Youngstown, O.

TUBING BENDERS

See Benders, Tubing

TUBING, BRASS AND COPPER

American Brass Co., Waterbury, Conn. (copper/steel admiralty/steel)
Brass & Copper Imports, Inc., New York, N. Y.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Gardiner Metal Co., Chicago, Ill.
H & H Tube & Mfg. Co., Detroit, Mich.
Helical Tube Corp., Grand Rapids, Mich.
Hussey & Co., C. G., Div. Copper Range Co., Pittsburgh, Pa.
Keeney Mfg. Co., Newington, Conn. (Chrome plated)
Kensico Tube Co., Mt. Kisco, N. Y.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Penn Brass & Copper Co., Erie, Pa.
Phelps Dodge Copper Products Corp., British American Tube Div., New York, N. Y.
Reading Tube Corp., New York, N. Y.
Revere Copper and Brass Incorporated, New York, N. Y.
Roberts Tube Works, Detroit, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (K-L-M)
United Wire & Supply Corp., Cranston, R. I.
Viking Copper Tube Co., Cleveland, O.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.

TUBING, BRONZE

American Brass Co., Waterbury, Conn.
Brass & Copper Imports, Inc., New York, N. Y.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Helical Tube Corp., Grand Rapids, Mich.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Revere Copper and Brass, Incorporated, New York, N. Y.

TUBING, CAPILLARY

American Brass Co., Waterbury, Conn.
Brass & Copper Imports, Inc., New York, N. Y.
Kenisco Tube Co., Mt. Kisco, N. Y.
Madden Brass Products Co., Aurora, Ill.
Revere Copper & Brass, Incorporated, New York.
Sawhill Tubular Products, Inc., Sharon, Pa.
Superior Tube Co., Norristown, Pa.
Techniflex Corp., Port Jervis, N. Y.
United Wire & Supply Corp., Cranston, R. I.
Wabash Corp., Chicago, Ill.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.

TUBING CUTTERS

See Cutters, Tubing

TUBING, DUPLEX

American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Phelps Dodge Copper Products Corp., British American Tube Div., New York, N. Y. (copper alloy)
Polymer Corp. of Pa., The, Reading, Pa. (nylon)
Republic Steel Corp., Steel & Tubes Div., Cleveland, O. (Steel and copper)
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.

TUBING, FABRIC, FLEXIBLE

Arrowhead Rubber Co., Long Beach, Calif.
Flexible Tubing Corp., Guilford, Conn.
Johns-Manville, New York, N. Y.

TUBING, FINNED

Aerofin Corp., Syracuse, N. Y.
Autorad, Inc., Chicago, Ill.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
G. & O. Mfg. Co., New Haven, Conn.
Griscom-Russell Co., The, Massillon, O.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lewis & Co., Joseph E., Baltimore, Md.
McCord Corp., Detroit, Mich.
Peerless of America, Inc., Chicago, Ill.
Quaid Fabrications, Inc., Philadelphia, Pa.
Rempe Co., Chicago, Ill.
Rome-Turney Radiator Co., Rome, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Tenney Engineering, Inc., Union, N. J.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United Wire & Supply Corp., Cranston, R. I.
Vapor Heating Corp., Chicago, Ill.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Detroit, Mich. (Aluminum, copper)

TUBING, MAGNESIUM

Dow Chemical Co., The, Midland, Mich.

TUBING, METAL, FLEXIBLE

Aeroquip Corp., Jackson, Mich.
American Metal Hose Div., American Brass Co., The, Waterbury, Conn.
Atlantic Metal Hose Co., Inc., New York.
Cobra Metal Hose Div., Chicago, Ill.
Flexonics Corp., Maywood, Ill.
International Metal Hose Co., Bellevue, O.
Johnson Metal Hose, Inc., Waterbury, Conn.
Marquette Coppersmithing Co., Philadelphia.
National Lead Co., New York, N. Y.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Techniflex Corp., Port Jervis, N. Y.
Titeflex, Inc., Newark, N. J.
United Metal Hose Co., Inc., Long Island City, N. Y.
Universal Metal Hose Co., Chicago, Ill.

TUBING, NICKEL AND NICKEL ALLOY

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Bundy Tubing Co., Detroit, Mich.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Electric Steel Foundry Co., Portland, Ore.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Helical Tube Corp., Grand Rapids, Mich.
International Nickel Co., Inc., The, New York, N. Y.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Revere Copper and Brass, Incorporated, New York, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Titeflex, Inc., Newark, N. J.
Trent Tube Co., East Troy, Wis.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Detroit, Mich.
Youngstown Welding & Engineering, Youngstown, O.

TUBING, PLASTIC

Alpha Plastics, Inc., W. Orange, N. J. (PVC)
American Agile Corp., Bedford, O. (flexible)
American Hard Rubber Co., New York, N. Y.
Anesite Co., Chicago, Ill. (polyethylene, butyrate)
Bakelite Co., Div. of Union Carbide & Carbon Chemical Co., New York, N. Y.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass. (PVC)
Carlon Products Corp., Cleveland, O.
Commercial Plastics Co., Chicago, Ill.
Continental Can Co., Millsplastic Pipe Div., New York, N. Y.
Continental-Diamond Fibre, Newark, Del.
Crane Co., Chicago, Ill.
Crescent Plastics, Inc., Evansville, Ind. (flexible)
Extruded Plastics, Inc., Norwalk, Conn.
Flexible Tubing Corp., Guilford, Conn.
Flexrock Co., Philadelphia, Pa.
Gates Rubber Co., The, Denver, Colo.
General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass. (phenolic laminated)
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hartwell & Son, Inc., H. N., Boston, Mass. (PVC)
Haveg Corp., Newark, Del.
Hudson Industries, Inc., Detroit, Mich.
Imperial Brass Mfg. Co., Chicago, Ill. (polyethylene)
Irvington Varnish and Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Manufacturers Corp., Mansfield, O.
Moore & Co., Samuel, Mantua, O. (polyethylene)
Munray Products, Inc., Cleveland, O. (polyethylene, vinyl)
National Tube Div., United States Steel Corp., Pittsburgh, Pa. (polyethylene flexible)
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif. (fibre and bakelite)
Polymer Corp. of Pa., The, Reading, Pa. (Nylon)
Reflin Co., San Diego, Calif. (rigid, reinforced with glass fibers)
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O. (Vinyl)
Resistoflex Corp., Belleville, N. J.
Richland Co., Mansfield, O.
Sandee Mfg. Co., Chicago, Ill.
Saran Lined Pipe Co., Ferndale, Mich.
Skyline Industries, Titusville, Pa.
Superior Tube Co., Norristown, Pa.
Titeflex, Inc., Newark, N. J. (Teflon)
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Vanton Pump & Equipment Corp., Hillside, N. J. (vinyl-Polethylene)
Yardley Plastics Co., Columbus, O. (polyethylene, clear, black)

TUBING, SILVER CLAD AND SILVER ALLOY

American Platinum Wks., Newark, N. J.
Baker & Co., Inc., Newark, N. J.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.

TUBING, STEEL, ALLOY, SEAMLESS

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
H & H Tube & Mfg. Co., Detroit, Mich.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Pittsburgh Steel Co., Pittsburgh, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Superior Tube Co., Norristown, Pa.
Timken Roller Bearing Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

TUBING, STEEL, ALLOY, WELDED

Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Duraloy Co., Scottdale, Pa.
H & H Tube & Mfg. Co., Detroit, Mich.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Laclede Steel Co., St. Louis, Mo.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis.
Youngstown Sheet & Tube Co., Youngstown, O.
Youngstown Welding & Engineering, Youngstown, O.

TUBING, STEEL, BRAZED

Bundy Tubing Co., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.

TUBING, STEEL, SEAMLESS

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Central Steel & Wire Co., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Phoenix Iron & Steel Co., Phoenixville, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Superior Tube Co., Norristown, Pa.
Timken Roller Bearing Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

TUBING, STEEL, STAINLESS

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
American Cast Iron Pipe Co., Birmingham, Ala.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Electric Steel Foundry Co., Portland, Ore.
Helical Tube Corp., Grand Rapids, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Pypon Co., Pittsburgh, Pa.
Republic Steel Corp, Steel & Tubes Div., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Stainless Welded Products, Inc., Clifton, N. J.
Standard Tube Co., Detroit, Mich.
Superior Tube Co., Norristown, Pa.
Timken Roller Bearing Co., Canton, O.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engrg., Youngstown, O.

TUBING, STEEL, WELDED

American Pipe & Steel Corp., Alhambra, Calif.
Armco Steel Corp., Middletown, O.
Avon Tube Div., Higbe Mfg. Co., Rochester, Mich.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Babcock & Wilcox Tube Co., The, Tubular Products Div., Alliance, O.
Bundy Tubing Co., Detroit, Mich.
Central Steel & Wire Co., Chicago, Ill.
Chicago Metal Mfg. Co., Chicago, Ill.
Crucible Steel Co. of America, Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Laclede Steel Co., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Nikoh Tube Co., Chicago, Ill.
Pacific Tube Co., Los Angeles, Calif.
Pittsburgh Tube Co., Pittsburgh, Pa.
Radiant Heat and Cooling Co., Santa Clara, Calif.
Republic Steel Corp., Cleveland, O.
Republic Steel Corp, Steel & Tubes Div., Cleveland, O.
Revere Copper and Brass, Incorporated, New York, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Sharon Steel Corp., Sharon, Pa.
South Chester Tube Co., Chester, Pa.

Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis.
Wheatland Tube Co., Philadelphia, Pa.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
Youngstown Sheet & Tube Co., Youngstown, O.
Youngstown Welding & Engineering, Youngstown, O.

TUBING, TITANIUM

Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Superior Tube Co., Norristown, Pa.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering, Youngstown, O.

TUBING, ZIRCONIUM

Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Superior Tube Co., Norristown, Pa.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering, Youngstown, O.

TURBINES, MECHANICAL DRIVE

Carling Turbine Blower Co., Worcester, Mass.
Coffin Co., J. S., Jr., Englewood, N. J.
Coppus Engineering Corp., Worcester, Mass.
Dean Hill Pump Co., Indianapolis, Ind.
De Laval Steam Turbine Co., Trenton, N. J.
Elliott Co., Jeannette, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Murray Iron Wks. Co., Burlington, Ia.
Pyle-National Co., The, Chicago, Ill.
Solar Aircraft Co., San Diego, Calif.
Steam Turbine Div., Worthington Corp., Wellesville, N. J.
Terry Steam Turbine Co., Hartford, Conn.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whiton Machine Co., New London, Conn.
Wing Mfg. Co., L. J., Linden, N. J.

2, 3 AND 4-WAY VALVES

See Valves, 2, 3 and 4-way

ULTRASONIC DUST AND FUME COLLECTION

See Collection, Dust and Fume, Ultrasonic

ULTRAVIOLET LAMPS

See Lamps, Sterilizing for Duct Installation; Units, Sterilizing, Air

UNDERGROUND PIPING

See Conduit, Underground Piping

UNDERWATER HEATERS

See Heaters, Steam Jet, for Liquids

UNIONS, BRASS

Acheson Mfg. Co., Rankin, Pa.
American Sanitary Mfg. Co., Abingdon, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
King Union Co., Inc., Hillsgrove, R. I.
Leavitt Machine Co., Orange, Mass.
Moran Flexible Joint Co., Louisville, Ky.
Mueller Brass Co., Port Huron, Mich.
New York Brass Foundry, New York, N. Y.
Northern Indiana Brass Co., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Rhode Island Fittings Co., Providence, R. I.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Metal Works, Chelsea, Mass.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Cleveland, O.

UNIONS, INSULATING

See Joints, Pipe, Electrical Insulating

UNIONS, MALLEABLE, BRASS SEAT

Beaton & Corbin Mfg. Co., Southington, Conn.
Corley Co., Inc., The, Jersey City, N. J.
Crane Co., Chicago, Ill.
Dart Union Co., Providence, R. I.
Das Div. of The Zeller Corp., Defiance, O.
Detroit Brass & Malleable Co., Detroit, Mich.
Fairbanks Co., The, New York, N. Y.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
General Fittings Co., East Greenwich, R. I.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Jefferson Union Co., Inc., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
King Union Co., Inc., Hillsgrove, R. I.
Malleable Iron Fittings Co., Branford, Conn.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Rhode Island Fittings Co., Providence, R. I.
Rockwood Sprinkler Co., Worcester, Mass.
Roylyn, Inc., Glendale, Calif.
Stockham Valves & Fittings, Birmingham, Ala.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.

UNIONS, ORIFICE

Catawissa Valve & Fittings Co., Catawissa, Pa.
Foxboro Co., Foxboro, Mass.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Roylyn, Inc., Glendale, Calif.
Taylor Forge & Pipe Wks., Chicago, Ill.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

UNIONS, STEEL

Anchor Coupling Co., Inc., Libertyville, Ill.
Capitol Mfg. & Supply Co., Columbus, O.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Champion Machine & Forging Co., Cleveland, O.
Chiksan Co., Brea, Calif.
Crane Co., Chicago, Ill.
Dart Union Co., Providence, R. I.
Das Div. of The Zeller Corp., Defiance, O.
Fairbanks Co., The, New York, N. Y.
Frick Co., Waynesboro, Pa.
Gilbert Brass Foundry Co., St. Louis, Mo.
Gray Tool Co., Houston, Tex.
Hasco Valve & Machine Co., Milwaukee, Wis. (Stainless steel and alloy only)
Henry Valve Co., Melrose Park, Ill.
Keystone Tool Corp., Houston, Tex.
Rockwood Sprinkler Co., Worcester, Mass.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

UNIT COOLERS

See Coolers, Unit

UNIT HEATERS

See Heaters, Unit

UNIT VENTILATORS

See Ventilators, Unit

UNITS, AIR CONDITIONING, FOR AUTOMOBILES

A.R.A. Mfg. Co., Ft. Worth, Texas
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Forston Co., Houston, Texas
Frigidaire Div., General Motors Corp., Dayton, O.
Harrison Radiator Div., General Motors, Lockport, N. Y.
Kool-Kar Co., Inc., Detroit, Mich.
Norris-Thermador Corp., Los Angeles, Calif.

UNITS, AIR CONDITIONING, BUS, TRUCK AND TRAILER

A.R.A. Mfg. Co., Ft. Worth, Texas.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Ellis & Watts Products, Inc., Cincinnati, O.
Keco Industries, Inc., Cincinnati, O.
McGraw Electric Co., Clark Div., Chicago, Ill.
Metal Products Eng., Inc., Los Angeles, Calif. (Truck only)
Trane Co., The, La Crosse, Wis.
U. S. Thermo Control Co., Minneapolis, Minn.
Waukesha Motor Co., Waukesha, Wis.

UNITS, AIR CONDITIONING, CENTRAL STATION TYPE

Self contained blower, heating and/or cooling coil, filter, humidifier unit for remote location and duct air distribution

Acme Industries, Inc., Jackson, Mich.
Addison Products Co., Addison, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Holland, O.
Alco Refrigeration Sales & Service, Inc., Cleveland, O.
Alton Mfg. Co., Dallas, Tex.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
American Thermal Industries, Inc., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Anetsberger Bros., Inc., Northbrook, Ill.
Armstrong Furnace Co., Columbus, O.
Bahnson Co., Winston-Salem, N. C.
Bal-Air, Inc., Nashville, Tenn.
Bishop & Babcock Mfg. Co., Cleveland, O.
Blazer, M., & Son, Passaic, N. J.
Brunner Mfg. Co., Utica, N. Y.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Coleman Co., Inc., The, Wichita, Kans.
Cool-Ette, Inc., Detroit, Mich.
Clarage Fan Co., Kalamazoo, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Deering Air Conditioning Co., The, Cincinnati, O.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati.
General Air Conditioning Corp., Los Angeles, Calif.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
General Electric Co., Commercial & Industrial Air Conditioning Dept., Bloomfield, N. J.
Gibson Refrigerator Co., Greenville, Mich.
Governair Corp., Oklahoma City, Okla.
Hastings Air Control, Inc., Omaha, Nebr.
Henry Furnace Co., Medina, O.
Howe Ice Machine Co., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lennox Industries, Inc., Columbus, O.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Meyer Furnace Co., The, Peoria, Ill.
Midwest Air Conditioning Co., Des Moines, Ia.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Palmer Mfg. Corp., Phoenix, Ariz.
Parks-Cramer Co., Fitchburg, Mass.
Payne Div. of Carrier Corp., Monrovia, Calif.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.

St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Schnacke, Inc., Evansville, Ind.
Servel, Inc., Evansville, Ind. (absorption type)
Silco Products, Inc., Minneapolis, Minn.
Sterling Air Conditioning Corp., Gastonia, N. C.
Surface Combustion Corp., Toledo, O.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, EXCLUSIVELY FOR HOSPITAL OPERATING ROOMS, WITH EXPLOSIONPROOF MOTOR

Trane Co., The, La Crosse, Wis.

UNITS, AIR CONDITIONING, HORIZONTAL PACKAGE TYPE

Self contained blower, cooling and/or heating coil, filter, humidifier unit for ceiling or platform location in space conditioned, for connection to remote compressor or cold water supply, and steam or hot water

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Holland, O.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Coils Co., Newark, N. J.
American Thermal Industries, Inc., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Bahnson Co., Winston-Salem, N. C.
Bal-Air, Inc., Nashville, Tenn.
Besser Metal Products Corp., Charlotte, N. C.
Blazer & Son, M., Passaic, N. J.
Brown Products Co., Forest Hills, N. Y.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Clime-Matic Corp., South Norwalk, Conn.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
General Electric Co., Air Conditioning Div., Bloomfield, N. J. (ceiling mounted)
Governair Corp., Oklahoma City, Okla.
Hastings Air Control, Inc., Omaha, Nebr.
International Mfg. Co., Oklahoma City, Okla.
Iron Fireman Mfg. Co., Cleveland, O.
Kennard Corp., St. Louis, Mo.
King Co. of Owatonna, The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Midwest Air Conditioning Co., Des Moines, Ia.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Payne Div. of Carrier Corp., Monrovia, Calif.
Refrigeration Appliances Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, INDUSTRIAL TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Holland, O.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
American Thermal Industries, Inc., Detroit, Mich.
Anetsberger Bros., Inc., Northbrook, Ill.
Armstrong Furnace Co., Columbus, O.
Bal-Air, Inc., Nashville, Tenn.
Bishop & Babock Mfg. Co., Cleveland, O.
Blazer & Son, M., Passaic, N. J.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clarage Fan Co., Kalamazoo, Mich.
Clime-Matic Corp., South Norwalk, Conn.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
General Electric Co., Commercial & Industrial Air Conditioning Dept., Bloomfield, N. J.
Governair Corp., Oklahoma City, Okla.
Haertel Co., Walter, Minneapolis, Minn.
Howe Ice Machine Co., Chicago, Ill.
Kennard Corp., St. Louis, Mo.
King Co. of Owatonna, The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lintern Corp., Painesville, O.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Midwest Air Conditioning Co., Des Moines, Ia.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Simplaire, New York, N. Y.
Somers, Inc., H. J., Detroit, Mich.
Surface Combustion Corp., Toledo, O.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, REVERSE REFRIGERATION CYCLE

Acme Industries, Inc., Jackson, Mich.
American Coils Co., Newark, N. J.
Brunner Mfg. Co., Utica, N. Y.
Drying Systems, Inc., Chicago, Ill.
Fedders-Quigan Corp., Buffalo, N. Y.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
General Electric Co., Commercial & Industrial Air Conditioning Dept., Bloomfield, N. J.
Mitchell Mfg. Co., Chicago, Ill.
Muncie Gear Works, Inc., Muncie, Ind.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
York Corp., York, Pa.

UNITS, AIR CONDITIONING, SUMMER, EVAPORATIVE COOLING TYPE

For cooling by evaporation, no dehumidification

Air-Cooling Engineering Co., Evanston, Ill.
Air Equipment Co., Denver, Colo.
Air Fan Engineering Co., Los Angeles, Calif.
Air & Refrigeration Corp., New York, N. Y.
Alton Mfg. Co., Dallas, Tex.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
American Moistening Co., Providence, R. I.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Austin Engineering & Mfg. Co., Inc., Ysleta (El Paso County), Texas
Bahnson Co., Winston-Salem, N. C.
Barwick Mfg. Corp., Wichita, Kan.
Buensod-Stacey, Inc., New York, N. Y.
Campbell Co., E. K., Kansas City, Mo.
Carrier Corp., Syracuse, N. Y.
Comfort Products Corp., Dallas, Tex.
Dearborn Stove Co., Dallas, Tex.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Essick Mfg. Co., Los Angeles, Calif.
Farr Co., Los Angeles, Calif.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Heating Assurance, Inc., Spokane, Wash.
International Metal Products Co., Phoenix, Ariz.
Kleer Kleen Mfg. Co., Hayward, Calif.
Lennox Industries, Inc., Marshalltown, Ia.
Lennox Industries, Inc., Columbus, O.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla. (vaporizers and pumps for evaporative coolers)
Martin Fan & Blower Co., Chicago, Ill.
Mountain States Equipment Co., Denver, Colo.
National Engineering & Mfg. Co., Sedalia, Mo.
National Gas Equipment Co., Inc., Denison, Tex.
Norris-Thermador Corp., Los Angeles, Calif.
Palmer Mfg. Co., Phoenix, Ariz.
Pioneer Furnace Co., Los Angeles, Calif.
Rheem Mfg. Co., New York, N. Y.
Rhode Island Humidifier & Ventilating Co., Boston, Mass.
Thermador Electrical Mfg., Los Angeles, Calif.
Thermo-Mat Co., Los Angeles, Calif. (asphalt fiber replacement mats)
Trade Wind Motorfans, Inc., Rivera, Calif.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United Electric Co., Wichita Falls, Tex.
Utility Appliance Corp., Los Angeles, Calif.
Western Blower Co., Seattle, Wash.
Wright Mfg. Co., Phoenix, Ariz.
X L Refrigerating Co., Chicago, Ill.

UNITS, AIR CONDITIONING, SUMMER, ROOM TYPE, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER, UNDER 3 TONS CAPACITY

Self contained blower, coil, filter unit for connection to remote compressor or cold water supply

Acme Industries, Inc., Jackson, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Airtron Corp., Holland, O.
Bal-Air, Inc., Nashville, Tenn.
Blazer & Son, M., Passaic, N. J.
Bush Mfg. Co., West Hartford, Conn.
Carlen Associates, New York, N. Y.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Clime-Matic Corp., South Norwalk, Conn.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Air Conditioning Dept., Bloomfield, N. J.
Hastings Air Control, Inc., Omaha, Neb.
Henry Furnace Co., Medina, O.
Kennard Corp., St. Louis, Mo.
Lennox Industries, Inc., Marshalltown, Ia.
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
McQuay, Inc., Minneapolis, Minn.
Mitchell Mfg. Co., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Milwaukee, Wis.
Nat Corp., Kansas City, Mo.
National-U. S. Radiator Corp., Johnstown, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Refrigeration Appliances, Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
Round Oak Co., Inc., Dowagiac, Mich.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Minneapolis, Minn.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, SUMMER, ROOM TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR, UNDER 3 HP

Self contained blower, coil, compresser, filter unit

Air Conditioning Engineering Co., Cambridge, Mass.
Airtron Corp., Holland, O.
Ajax Corp. of America, Evansville, Ind.
Armstrong Furnace Co., Columbus, O.
Automatic Firing Corp., St. Louis, Mo.
Bal-Air, Inc., Nashville, Tenn.
Brunner Mfg. Co., Utica, N. Y.
Carrier Corp., Svracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Cool-Ette, Inc., Detroit, Mich.
Delta Heating Corp., Trenton, N. J.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fedders-Quigan Corp., Buffalo, N. Y.
General Air Conditioning Corp., Los Angeles, Calif.
Henry Furnace Co., Medina, O.
Hotpoint Co., Chicago, Ill.
Ingersoll Conditioned Air Div., Borg-Warner Corp., Kalamazoo, Mich.
Marlo Coil Co., St. Louis, Mo.
Mitchell Mfg. Co., Chicago, Ill.
Mueller Climatrol, Milwaukee, Wis.
Nat Corp., Kansas City, Mo.
Philco Corp., Philadelphia, Pa.
Primor Products, Inc., Adrian, Mich.
RCA Victor Div., Radio Corp. of America, Camden, N. J.
Rinehart, Inc., Richmond, Ind.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Round Oak Co., Dowagiac, Mich.
Schnacke, Inc., Evansville, Ind.
Servel, Inc., Evansville, Ind.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Surface Combustion Corp., Toledo, O.
Sutton Corp., O. A., The, Wichita, Kan.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Williamson Co., Cincinnati, O.
York Corp., York, Pa.

UNITS, AIR CONDITIONING, SUMMER, STORE TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR, 3 HP AND OVER

Self contained blower, coil, compressor, filter unit with air discharge approximately 6 ft above floor

Airtron Corp., Holland, O.
American Coil Co., Newark, N. J.
American Standard, Air Conditioning Div., New York, N. Y.
American Thermal Industries, Inc., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Armstrong Furnace Co., Columbus, O.
Automatic Firing Corp., St. Louis, Mo.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Brunner Mfg. Co., Utica, N. Y.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Coleman Co., Inc., The, Wichita, Kans.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Delta Heating Corp., Trenton, N. J.
Frick Co., Waynesboro, Pa.
Frigid, Inc., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
General Electric Co., Commercial & Industrial Air Conditioning Dept., Bloomfield, N. J.
Gibson Refrigerator Co., Greenville, Mich.
Governair Corp., Oklahoma City, Okla.
Henry Furnace Co., Medina, O.
Ingersoll Conditioned Air Div., Borg-Warner Corp., Kalamazoo, Mich.
Koch Refrigerators, Inc., Kansas City, Kans.
Midwest Air Conditioning Co., Des Moines, Ia.
Mitchell Mfg. Co., Chicago, Ill.
Mueller Climatrol, Milwaukee, Wis.
Nat Corp., Kansas City, Mo.
National-U. S. Radiator Corp., Johnstown, Pa.
Philco Corp., Philadelphia, Pa.
Primor Products, Inc., Adrian, Mich.
Quiet-Heet Mfg. Corp., Newark, N. J.
Rinehart, Inc., Richmond, Ind.
Round Oak Co., Inc., Dowagiac, Mich.
Sterling Air Conditioning Corp., Gastonia, N. C.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Surface Combustion Corp., Toledo, O.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitehall Engineering Co., Chicago, Ill.
Williams Div., Eureka Williams Co., Div. of Henney Motors Co., Inc., Bloomington, Ill.
Williamson Co., Cincinnati, O.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.

UNITS, AIR CONDITIONING, SUMMER, WALL TYPE, SELF-CONTAINED, FOR MOUNTING THROUGH WALL ONLY

Amic Mfg. Corp., Long Island City, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
General Electric Co., Major Appliance Div., Louisville, Ky.
Lewyt Air-Conditioner Corp., Brooklyn, N. Y.
Mueller Climatrol, Milwaukee, Wis.
Sutton Corp., O. A., The, Wichita, Kans.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.

UNITS, AIR CONDITIONING, WINDOW, FOR CASEMENT WINDOWS

American Motors Corp., Kelvinator Div., Detroit, Mich.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O. (with provision for heating)
Deering Air Conditioning Co., The, Cincinnati, O.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Major Appliance Div., Louisville, Ky.
Hunter Fan & Ventilating Co., Inc., Memphis, Tenn.
Mitchell Mfg. Co., Chicago, Ill.
National-U. S. Radiator Corp., Johnstown, Pa.
Philco Corp., Philadelphia, Pa. (Heating element available)
Quiet-Heet Mfg. Corp., Newark, N. J. (heating optional)
Robbins & Myers, Inc., Fan Div., Memphis, Tenn.
Sutton Corp., O. A., The, Wichita, Ks.
Universal Major Electric Appliances, Inc., Baltimore, Md.
Victor Products Corp., Hagerstown, Md.
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass.

UNITS, AIR CONDITIONING, WINDOW, FOR DOUBLE-HUNG WINDOWS

Addison Products Co., Addison, Mich.
Admiral Corp., Chicago, Ill.
Air Conditioning Engineering Co., Cambridge, Mass.
Amana Refrigeration, Inc., Amana, Ia.
American Motors Corp., Kelvinator Div., Detroit, Mich. (some heating elements)
Automatic Firing Corp., St. Louis, Mo.
Bard Mfg. Co., Bryan, O.
Blissfield Mfg. Co., Blissfield, Mich.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Cauhorn Distributing Co., Detroit, Mich.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O. (with provision for heating)
Coolerator Co., Duluth, Minn.
Deepfreeze Appliance Div., Motor Products Corp., North Chicago, Ill. (some models have heating elements)
Deering Air Conditioning Co., The, Cincinnati, O. (for casement windows)
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Emerson Radio and Phonograph Corp., Jersey City, N. J.
Fedders-Quigan Corp., Buffalo, N. Y.
Forston Co., Houston, Texas
Fresh'nd-Aire Company, Div. of Cory Corp., Chicago, Ill.
Friedrich Refrigerators, Inc., San Antonio, Tex.
Frigid, Inc., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton, O.

General Electric Co., Major Appliance Div., Louisville, Ky.
Gibson Refrigerator Co., Greenville, Mich.
Great Northern Mfg. Corp., Chicago, Ill.
Hotpoint Co., Chicago, Ill.
Hunter Fan and Ventilating Co., Inc., Memphis, Tenn.
International Harvester Co., Chicago, Ill.
King Refrigerator Co., Glendale, N. Y.
Lewyt Air-Conditioner Corp., Brooklyn, N. Y.
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Mathis Co., The, Ft. Worth, Tex.
McGraw Electric Co., Lonergan Mfg. Div., Albion, Mich.
Mitchell Mfg. Co., Chicago, Ill.
Mueller Climatrol, Milwaukee, Wis.
National Engineering & Mfg. Co., Sedalia, Mo.
National Steel Construction Co., Logansport, Ind.
National-U. S. Radiator Corp., Johnstown, Pa.
Payne Div. of Carrier Corp., Monrovia, Calif.
Philco Corp., Philadelphia, Pa. (heating element available)
Quiet-Heet Mfg. Corp., Newark, N. J. (heating optional)
Radio Corp. of America, RCA Victor Div., Camden, N. J.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rheem Mfg. Co., Chicago, Ill.
Robbins & Myers, Inc., Fan Div., Memphis, Tenn.
Sears Roebuck & Co., Chicago, Ill.
Servel, Inc., Evansville, Ind.
Sterling Air Conditioning Corp., Gastonia, N. C.
Sub-Zero Freezer Co., Inc., Madison, Wis.
Sutton Corp., O. A., The, Wichita, Kan.
United States Air Conditioning Corp., Minneapolis, Minn.
Universal Major Electric Appliances, Inc., Baltimore, Md.
Victor Products Corp., Hagerstown, Md.
Viking Mfg. Corp., Cleveland, O. (heating element optional)
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass. (with or without heating element)
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

UNITS, AIR CONDITIONING, WINTER, ROOM TYPE, FLOOR CABINET

Self contained blower, filter, heating coil, humidifier unit

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Aladdin Heating Corp., Oakland, Calif.
Auburn Burner Co., Auburn, Ind.
Barkow Mfg. Co., Inc., Aug. G. Milwaukee, Wis.
Buffalo Forge Co., Buffalo, N. Y.
Campbell Heating Co., Des Moines, Ia.
Clarage Fan Co., Kalamazoo, Mich.
Dalzen Mfg. Co., St. Clair, Mich.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Kehm Corp., The, Chicago, Ill.
Kennard Corp., St. Louis, Mo.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Mitchell Mfg. Co., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Somers, Inc., H. J., Detroit, Mich.
Surface Combustion Corp., Toledo, O.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Minneapolis, Minn.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Witt Co., A. H., Los Angeles, Calif.
York Corp, York, Pa.

UNITS, AIR CONDITIONING, YEAR AROUND, FAN-COIL TYPE, FOR INSTALLATION WITH OR WITHOUT CABINET IN ROOM, OR IN CLOSET SPACE, OVER CORRIDOR, ETC.

(Comprises Blower, Chilled Water Direct Expansion or Hot Water Coil, for Connection to Remote Compressor or Chilled Water Supply)

Acme Industries, Inc., Jackson, Mich.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Auburn Burner Co., Auburn, Ind.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Brown Products Co., Forest Hills, N. Y.
Carrier Corp., Syracuse, N. Y.
Coleman Co., Inc., The, Wichita, Kans.
Deansteel Products Co., San Antonio, Texas
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Mitchell Mfg. Co., Chicago, Ill.
Peerless of America, Inc., Chicago, Ill.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET

Self contained blower, cooling and heating coil, filter, humidifier unit for connection to remote compressor or cold water supply, and steam or hot water supply

Acme Industries, Inc., Jackson, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Holland, O.
American Coils Co., Newark, N. J.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Auburn Burner Co., Auburn, Ind.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Brown Products Co., Forest Hills, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Clime-Matic Corp., South Norwalk, Conn.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham Co., Chicago, Ill.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Hastings Air Control, Inc., Omaha, Nebr.
Kennard Corp., St. Louis, Mo.
Koch Refrigerators, Inc., Kansas City, Kans.
Kramer Trenton Co., Trenton, N. J.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Nat Corp., Kansas City, Mo.
National-U. S. Radiator Corp., Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Refrigeration Appliances, Inc., Chicago, Ill.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rittling Corp., The, Buffalo, N. Y.
Servel, Inc., Evansville, Ind.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Minneapolis, Minn.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET, INDUCTION

Self-Contained Cooling and Heating Coil, Filter, Etc. for Connection to High Pressure Primary Air Supply, Cold Water Supply, and Hot Water Supply

Barkow Mfg. Co., Inc., Aug. G. Milwaukee, Wis.
Carrier Corp., Syracuse, N. Y.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Deering Air Conditioning Co., The, Cincinnati, O.
York Corp., York, Pa.

UNITS, CONDENSATE DISPOSAL, FOR AIR CONDITIONING

See Pumps, Condensate, For Removing Condensation from Air Conditioning Units

UNITS, FUEL OIL, HEATING, PUMPING AND STRAINING

Ace Engineering Co., Chicago, Ill.
Alco Products, Inc., Schenectady, N. Y.
Barclay, Inc., Robert, Chicago, Ill.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Drying Systems, Inc., Chicago, Ill.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Engineer Co., New York, N. Y.
Faber Engineer Co., Philadelphia, Pa.
Hauck Mfg. Co., Brooklyn, N. Y.
Hite Mfg. Co., N. E., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Kingsley Mfg. Co., New Haven, Conn. (tester for)
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y.
Leahy Mfg. Co., Los Angeles, Calif.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Peabody Engineering Corp., New York, N. Y.
Petro, Cleveland, O.
Preferred Utilities Mfg. Corp., New York, N. Y.
Ray Oil Burner Co., San Francisco, Calif.
Staples & Pfeiffer, San Francisco, Calif.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Tuthill Pump Co., Chicago, Ill.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Webster Electric Co., Racine, Wis.
Wilson Engineering Corp., Chicago, Ill.

UNITS, HEAT RECOVERY, AIR-TO-AIR

Air Conditioning Engineering Co., Cambridge, Mass.
Heatube Corp., Allegan, Mich.
Therm-o-Wheel, Inc., Far Rockaway, N. Y.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.

UNITS, STERILIZING, AIR

Air Purification Service, Inc., New York, N. Y.
Cooper Hewitt Electric Co., Hoboken, N. J.
Germatrol Corp., Pittsburgh, Pa.
Hanovia Chemical & Mfg. Co., Newark, N. J.
Iron City Chemical and Construction Corp., Glycolator Sales & Service, Pittsburgh, Pa.
Lientz Co., B. P., Kansas City, Mo.
Pittsburgh Chemical Laboratories, Inc., Pittsburgh, Pa.
Sampson Chemical & Pigment Corp., Chicago, Ill.
Sperti, Faraday Inc., Hoboken, N. J.

UNITS, WINDOW VENTILATOR AND FILTER

Airgard Mfg. Co., Chicago, Ill.
Air-Net Appliance Corp., Chicago, Ill. (with heating unit)
Goettl Bros. Metal Prod., Inc., Phoenix, Ariz.
Goodwill Mfg. Co., Chicago, Ill.
Ilg Electric Ventilating Co., Chicago, Ill.
Kaiser Co., H. S., Chicago, Ill.
Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Palmer Mfg. Corp., Phoenix, Ariz.

Reed Unit-Fans, Inc., New Orleans, La.
Somers Inc., H. J., Detroit, Mich.
Standard Electric Mfg. Co., West Berlin, N. J.
Utility Appliance Corp., Los Angeles, Calif.

UNIVERSAL JOINTS

See Joints, Universal, for Operating Valves

VACUUM CLEANERS FOR BOILERS

See Cleaners, Vacuum, for Boilers

VACUUM CLEANING SYSTEMS, FITTINGS FOR

See Fittings for Central Vacuum Cleaning Systems

VACUUM GAGES

See Gages, Indicating, Vacuum

VACUUM HEATING SYSTEMS

See Systems, Heating, Vacuum

VACUUM PUMPS

See Pumps, Vacuum

VACUUM RECORDERS

See Recorders, Pressure and Vacuum

VALVE OPERATORS

See Operators, Valve

VALVE RESEATERS

See Reseaters, Valve

VALVES, AIR OPERATING

A-P Controls Corp., Milwaukee, Wis.
Airmatic Valve, Inc., Cleveland, O.
American Moistening Co., Providence, R. I.
Atlas Valve Co., Newark, N. J.
Automatic Switch Co, Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barksdale Valves, Los Angeles, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Clark Controller Co., Cleveland, O.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.
De Zurik Shower Co., Sartell, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gotham Instrument Co., Div., American Machine & Metals, Inc., New York, N. Y.
Hammel-Dahl Co., Providence, R. I.
Hanna Engineering Wks., Chicago, Ill.
Hasco Valve & Machine Co., Milwaukee, Wis.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt & Son, Inc., C. B., Salem, O.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Co., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Ledeen Mfg. Co., Los Angeles, Calif.
Leslie Co., Lyndhurst, N. J.
Lunkenheimer Co., Cincinnati, O.
McAlear Mfg. Co., Chicago, Ill.
McRae Corp., Glendale, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Norwalk Valve Co., South Norwalk, Conn.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Powell Co., Wm., The, Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
R.K.L. Valve & Mfg. Co., Philadelphia, Pa.
Rockwood Sprinkler Co., Worcester, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco.
Vernon Tool Co., Ltd., Alhambra, Calif.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Inc., New Orleans, La.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wilson Engineering Corp., Chicago, Ill.

VALVES, ANGLE

ACF Industries, Detroit, Mich.
Alloy Steel Products Co., Linden, N. J. (Stainless steel)
American Car & Foundry Co., New York, N. Y.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Belknap Mfg. Co., Bridgeport, Conn.
Bordo Co., Inc., L. J., Glenside, Pa. (Plug)
Carpenter Valve Corp., The, Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Cla-Val Co., Newport Beach, Calif.
Cleveland Brass Mfg. Co., The, Cleveland, O.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., St. Louis, Mo.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
De Zurik Shower Co., Sartell, Minn.
Duriron Co., The, Dayton, O. (acid resisting)
Edward Valves, Inc., East Chicago, Ind.
Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Frick Co., Waynesboro, Pa.
General Ceramics Corp., Keasbey, N. J. (porcelain)
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)
Haveg Corp., Newark, Del. (plastic and plastic body)
Henry Valve Co., Melrose Park, Ill.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Leslie Co., Lyndhurst, N. J.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard Rubber)
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Nason Co., Clarkston, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Powell Co., Wm., Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., Hillside, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, AUTOMATIC SHUTOFF WITH MANUAL RESET

A-P Controls Corp., Milwaukee, Wis.
Automatic Switch Co., Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Cla-Val Co., Newport Beach, Calif.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Maxon Premix Burner Co., Muncie, Ind.
McDonald Mfg. Co., A.Y., Dubuque, Ia.
McRae Corp., Glendale, Calif.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Norwalk Valve, South Norwalk, Conn.
P-K Industries, Inc., North Arlington, N. J.
Roylyn, Inc., Glendale, Calif.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Sullivan Valve & Engineering Co., Butte, Mont.
Thermac Co., Los Angeles, Calif.
Valco, Inc., Cincinnati, O.
Vernon Tool Co., Ltd., Alhambra, Calif.

VALVES, BACK PRESSURE

Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Cla-Val Co., Newport Beach, Calif.
Cochrane Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Fisher Governor Co., Marshalltown, Ia.
Hammel-Dahl Co., Providence, R. I.
Hershey Mfg. Co., South Boston, Mass.
Hubbell Corp., Mundelein, Ill.
Illinois Engrg. Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Co., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Klipfol Valves, Inc., Hamilton, O.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
McRae Corp., Glendale, Calif.
Norwalk Valve Co., South Norwalk, Conn.
Pokorney Mfg. Co., Chicago, Ill.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Spence Engineering Co., Inc., Walden, N. Y.

VALVES, BALANCING, FOR FORCED HOT WATER HEATING SYSTEMS

Bell & Gossett Co., Morton Grove, Ill.
Detroit Controls Corp., Detroit, Mich.
Farris Engineering Corp., Palisades Park, N. J.
G & H Mfg. Co., Philadelphia, Pa.
General Heaters & Regulators Co., East Chicago, Ind.
Hammond Brass Works, Hammond, Ind.
Hi-Flow Products, Inc., Copiague, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
J O Mfg. Co., South Gate, Calif.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Quality Specialty Co., Inc., Camden, N. J.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
T & H Engineering Co., Little Ferry, N. J.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Welsbach Corp., The, Kitson Div., Philadelphia, Pa.

VALVES, BALL TYPE

Carpenter Valve Corp., The, Cleveland, O.
Fairbanks Co., The, New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Multiplex Mfg. Co., Berwick, Pa.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Rockwood Sprinkler Co., Worcester, Mass.
Smith Co., S. Morgan, York, Pa.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, BAR STOCK

Automatic Switch Co., Orange, N. J.
Carpenter Valve Mfg. Co., Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grove Valve and Regulator Co., Oakland, Calif.
Guardian Products Corp., Michigan City, Ind.
Hammel-Dahl Co., Providence, R. I.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockford Sprinkler Co., Worcester, Mass.
Shank Co., Cyrus, Chicago, Ill.
Star Stainless Screw Co., Paterson, N. J.
Trerice Co., H. O., Detroit, Mich.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Cleveland, O.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, BLOW-OFF

Automatic Switch Co., Orange, N. J.
Barrett Machine Co., Pittsburgh, Pa.
Bordo Co., Inc., L. J., Glenside, Pa.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Crane Co., Chicago, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.
Edward Valves, Inc., East Chicago, Ind.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jenkins Bros., New York, N. Y.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Madden Corp., The, Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonnell & Miller, Inc., Chicago, Ill.
Norgren Co., C. A., Englewood, Colo.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Shank Co., Cyrus, Chicago, Ill.
Strong, Carlisle & Hammond Co., Cleveland, O.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Wilson Engineering Corp., Chicago, Ill.
Yarnall-Waring Co., Philadelphia, Pa.

VALVES, BOILER, NON-RETURN

Crane Co., Chicago, Ill.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Lunkenheimer Co., Cincinnati, O.
McAlear Mfg. Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.

VALVES, BRAZED END

Fairbanks Co., The, New York, N. Y.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jenkins Bros., New York, N. Y.
Ohio Brass Co., Mansfield, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Walworth Co., New York, N. Y.

VALVES, BUTTERFLY

Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fabri-Valve Co. of America, Portland, Ore.
Fisher Govenor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware)
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)
Hauck Mfg. Co., Brooklyn, N. Y.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Keystone Tool Corp., Houston, Tex.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y. (all iron for gas service)
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
North American Mfg. Co., Cleveland, O.
Norwalk Valve Co., South Norwalk, Conn.
Powell Co., Wm., The, Cincinnati, O.
Pratt Co., Henry, Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Roylyn, Inc., Glendale, Calif.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Smith Co., S. Morgan, York, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, BYPASS, WITH PROVISIONS FOR SOME CIRCULATION WHEN CLOSED

Jenkins Bros., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Morrison Brothers Co., Dubuque, Ia.
Mueller Brass Co., Port Huron, Mich.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Powell Co., Wm., The, Cincinnati, O.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Stockham Valves & Fittings Co., Birmingham, Ala.

VALVES, CHECK

Alloy Steel Products Co., Linden, N. J. (stainless steel)
American Car & Foundry Co., New York, N. Y.
American Hard Rubber Co., New York, N. Y. (Hard rubber)
Aminco Refrigeration Products, American Injector Co., Detroit, Mich. (Refrigeration)
Amp Corp., St. Louis, Mo.
Associated Valve & Engineering Corp., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Barrett, Haentjens & Co., Hazelton, Pa.
Belknap Mfg. Co., Bridgeport, Conn.
Cameron Iron Works, Inc., Houston, Tex.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Cla-Val Co., Newport Beach, Calif.
Cochrane Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Durabla Mfg. Co., New York, N. Y.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Fabri-Valve Co. of America, Portland, Ore.
Fairbanks Co., The, New York, N. Y.
Foster Engineering Co., Union, N. J.
General Ceramics Corp., Keasbey, N. J. (ceramics)
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grinnell Co., Inc., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy only)
Hersey Mfg. Co., South Boston, Mass.
Imperial Brass Mfg. Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
James-Pond-Clark, Pasadena, Calif.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Keystone Tool Corp., Houston, Tex.
Knights Co., James, Sandwich, Ill.
LaBour Co., Inc., The, Elkhart, Ind.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead lined)
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green, Cleveland, O.
Marman Products Co., Inc., A Subsidiary of Aeroquip Corp., Los Angeles, Calif.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McRae Corp., Glendale, Calif.
Miller Valve Co., Inc., Pittsburgh, Pa. (Silent)
Milwaukee Valve Co., Milwaukee, Wis.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Norwalk Valve Co., South Norwalk, Conn.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.

Phillips & Co., H. A., Chicago, Ill.
Pittsburgh Valve Co., Reedsville, W. Va.
Pokorney Mfg. Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Roylyn, Inc., Glendale, Calif.
Schaible Co., The, Cincinnati, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Smith Co., S. Morgan, York, Pa.
Smolensky Valve Co., Inc., Bedford, O.
Stockham Valves & Fittings, Birmingham, Ala.
Strong, Carlisle & Hammond Co., Cleveland, O.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vanton Pump & Equipment Corp., Hillside, N. J. (plastic)
Walworth Co., New York, N. Y.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (Noiseless)
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, CHECK, BRONZE

Associated Valve & Engineering Co., Chicago.
Barrett Haentjens & Co., Hazelton, Pa.
Cla-Val Co., Newport Beach, Calif.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fairbanks Co., The, New York, N. Y.
Foster Engineering Co., Union, N. J.
Grinnell Co., Inc., Providence, R. I.
Grove Valve & Regulator Co., Oakland, Calif.
Hammond Brass Wks., Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
James-Pond-Clark, Pasadena, Calif.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McRae Corp., Glendale, Calif.
Miller Valve Co., Inc., Pittsburgh, Pa.
Milwaukee Valve Co., Milwaukee, Wis.
Morrison Brothers Co., Dubuque, Ia.
Norwalk Valve Co., South Norwalk, Conn.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Rockford Brass Works, Rockford, Ill.
Roylyn, Inc., Glendale, Calif.
Schaible Co., The, Cincinnati, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Pump Valve Co., Hoboken, N. J.
Smolensky Valve Co., Inc., Bedford, O.
Stockham Valves & Fittings Co., Birmingham, Ala.
Walworth Co., New York, N. Y.
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Gauge Co., Inc., Pittsburgh, Pa.

VALVES, CHECK, IRON

Barrett Haentjens & Co., Hazelton, Pa.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Cla-Vale Co., Newport Beach, Calif.
Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Fairbanks Co., The, New York, N. Y.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Grove Valve & Regulator Co., Oakland, Calif.
Henry Valve Co., Melrose Park, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
McDonald Mfg. Co., A.Y., Dubuque, Ia.
McRae Corp., Glendale, Calif.
Miller Valve Co., Inc., Pittsburgh, Pa.
Northern Indiana Brass Co., Elkhart, Ind.
Norwalk Valve Co., South Norwalk, Conn.
OPW Corp., Cincinnati, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Reading, Pa.
Roylyn, Inc., Glendale, Calif.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Smolensky Valve Co., Inc., Bedford, O.
Stockham Valves & Fittings Co., Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Walworth Co., New York, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

VALVES, CHECK, STEEL

Associated Valve & Engineering Co., Chicago.
Cla-Val Co., Newport Beach, Calif.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grove Valve & Regulator Co., Oakland, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
James-Pond-Clark, Pasadena, Calif.
Jenkins Bros., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green, Cleveland, O.
McRae Corp., Glendale, Calif.
Miller Valve Co., Inc., Pittsburgh, Pa.
Norwalk Valve Co., South Norwalk, Conn.
OPW Corp., Cincinnati, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Roylyn, Inc., Glendale, Calif.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Smolensky Valve Co., Inc., Bedford, O.
Stockham Valves & Fittings Co., Birmingham, Ala.
U. S. Pipe & Mfg. Co., So. San Francisco, Calif.
Vernon Tool Co., Ltd., Alhambra, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh

VALVES, COMPRESSOR

Bakeraire Corp., South Windham, Me.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Detroit Stamping Co., Detroit, Mich.
Durabla Mfg. Co., New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Mueller Brass Co., Port Huron, Mich.
OPW Corp., Cincinnati, O.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Schaible Co., The, Cincinnati, O.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., The, Milwaukee, Wis.
Voss Co., J. H. H., Inc., New York, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, CYLINDER OPERATED

Airmatic Valve, Inc., Cleveland, O.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Everlasting Valve Co., Jersey City, N. J.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hammel-Dahl Co., Providence, R. I.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt & Son, Inc., C. B., Salem, O.
Jenkins Bros., New York, N. Y.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Rockwell Co., W. S., Fairfield, Conn.
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Smith Co., S. Morgan, York, Pa.

VALVES, DIAPHRAGM

(Diaphragm controller elements controls opening of valve)

A-P Controls Corp., Milwaukee, Wis.
American Hard Rubber Co., New York, N. Y.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Automatic Switch Co., Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black,Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Dahl, G. W., Bristol, R. I.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Defender Instrument & Regulator Co., St. Louis, Mo.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fabri-Valve Co. of America, Portland, Ore.
Farris Engineering Corp., Palisades Park, N. J.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Golden-Anderson Valve Spec. Co., Pittsburgh, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Hills-McCanna Co., Chicago, Ill.
Hubbell Corp., Mundelein, Ill.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Skokie, Ill.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
Mueller Steam Specialty Co., Long Island City, N. Y.
North American Mfg. Co., Cleveland, O.
P-K Industries, Inc., North Arlington, N. J.
Parks-Cramer Co., Fitchburg, Mass.
Paul Valve Corp., New York, N. Y.
Powers Regulator Co., Skokie, Ill.
R.K.L. Valve & Mfg. Co., Philadelphia, Pa.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich.
Sarco Co., Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Squires Co., C. E., The, Cleveland, O.
Swartwout Co., The, Cleveland, O.
Trerice Co., H. O., Detroit, Mich.

United States Rubber Co., New York, N. Y.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

VALVES, DIAPHRAGM (Diaphragm itself throttles or shuts off flow)

A-P Controls Corp., Milwaukee, Wis.
American Hard Rubber Co., New York, N. Y.
Associated Valve & Engineering Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., St. Louis, Mo.
Farris Flexible Valve Corp., Palisades Park, N. J.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware)
General Controls Co., Glendale, Calif.
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hills-McCanna Co., Chicago, Ill.
Hunt & Son, Inc., C. B., Salem, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Keckley Co., O. C. Skokie, Ill.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mueller Brass Co., Port Huron, Mich.
Mueller Steam Specialty Co., Long Island City, N. Y.
Norwalk Valve Co., South Norwalk, Conn.
Penn Industrial Instrument Div. of Burgess-Manning Co., Philadelphia, Pa.
Saran Lined Pipe Co., Ferndale, Mich.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Trerice Co., H. O., Detroit, Mich.
United States Rubber Co., New York, N. Y.
Walworth Co., New York, N. Y. (plastic PVC diaphragm)
Warren Engineering Co., Broadway, N. J.
Weston Electrical Instruments Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
White-Rodgers Electric Co., St. Louis, Mo.

VALVES, DIAPHRAGM (Diaphragm used as seal between body and bonnet)

American Hard Rubber Co., New York, N. Y.
Associated Valve & Engineering Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Dept. P, Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., St. Louis, Mo.
Duriron Co., Inc., The, Dayton, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Flexible Valve Corp., Palisades Park, N. J.
General Controls Co., Glendale, Calif.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Co., Providence, R. I.
Haveg Corp., Newark, Del.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Klipfel Valves, Inc., Hamilton, O.
Knight, Maurice A., Akron, O. (molded resin for acids)
Leslie Co., Lyndhurst, N. J.
McRae Corp., Glendale, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Norwalk Valve Co., South Norwalk, Conn.
Research Vacuum Supply Co., Chicago, Ill.
Richmond Foundry & Mfg. Co., Inc., The, Richmond, Va.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trane Co., The, La Crosse, Wis.
United States Rubber Co., New York, N. Y.

Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

VALVES, FIRE PROTECTION, SPRINKLER SYSTEM CONTROL

Allen Mfg. Co., W. D., Chicago, Ill.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hersey Mfg. Co., South Boston, Mass.
Hodgman Mfg. Co., Inc., Taunton, Mass.
Jenkins Bros., New York, N. Y.
Keckley Co., O. C., Skokie, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
McRae Corp., Glendale, Calif.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwood Sprinkler Co., Worcester, Mass.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Security Valves Corp., Glendale, Calif.
Stockham Valves & Fittings, Birmingham, Ala.
Valco, Inc., Cincinnati, O.
Vernon Tool Co., Ltd., Alhambra, Calif.

VALVES, FLOAT

A-P Controls Corp., Milwaukee, Wis. (Oil)
Alco Valve Co., St. Louis, Mo.
American Hard Rubber Co., New York, N. Y. (Hard rubber)
American Moistening Co., Providence, R. I.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Boylston Steam Specialty Co., Chicago, Ill.
Cla-Val Co., Newport Beach, Calif.
Cleveland Humidifier Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Detroit Controls Corp., Detroit, Mich.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Frick Co., Waynesboro, Pa.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hubbell Corp., Mundelein, Ill.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Locke Regulator Co., Salem, Mass.
Ludlow Valve Mfg., Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monash-Younker Co., Chicago, Ill.
Mueller Brass Co., Port Huron, Mich.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Multiplex Mfg. Co., Berwick, Pa.
Phillips & Co., H. A., Chicago, Ill.
Robert Mfg. Co., Los Angeles, Calif.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Shade Valve Mfg. Co., Philadelphia, Pa.
Schaub Engineering Co., Fred H., Chicago, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scoville Mfg. Co., Waterville Div., Waterville, Conn.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Stickle Steam Specialties Co., Indianapolis, Ind.
Taco Heaters, Inc., Cranston, R. I.
Thermo-Mat Co., Los Angeles, Calif.
TOT Towers, Inc., Houston, Tex.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.

VALVES, FLOW CONTROL, FOR HOT WATER HEATING SYSTEMS

Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.
Dunham Co., C. A., Chicago, Ill.
Econo Products Company, Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif., and Skokie, Ill.
General Heaters & Regulators Co., East Chicago, Ind.
Hammel-Dahl Co., Providence, R. I.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
Kates Co., W. A., Deerfield, Ill.
Kehm Corp., The, Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Quality Specialty Co., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
White Flomatic Corp., Hoosick Falls, N. Y.

VALVES, FORGED STEEL

Alco Products, Inc., Schenectady, N. Y.
American Meter Co., Inc., Philadelphia, Pa.
Catawissa Valves & Fittings Co., Catawissa, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Grove Valve and Regulator Co., Oakland, Calif.
Henry Valve Co., Melrose Park, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Smith Co., S. Morgan, York, Pa.
Superior Valve & Fittings Co., Pittsburgh
Taylor Instrument Companies, Rochester, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, GATE, ALLOY

Alloy Steel Products Co., Linden, N. J.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Edward Valves, Inc., East Chicago, Ind.
Electric Steel Foundry Co., Portland, Ore.

Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Stockham Valves & Fittings Co., Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, GATE, ALUMINUM

Darling Valve & Mfg. Co., Williamsport, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Milwaukee Valve Co., Milwaukee, Wis.
OPW Corp., Cincinnati, O.
Powell Co., Wm., The, Cincinnati, O.
Rockwell Co., W. S., Fairfield, Conn.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, GATE, BRASS AND BRONZE

American Brass Co., Waterbury, Conn.
Belknap Mfg. Co., Bridgeport, Conn.
Bordo Co., Inc., L. J., Glenside, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Darling Valve Mfg. Co., Williamsport, Pa.
Detroit Brass & Malleable Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Fischer & Porter Co., Hatboro, Pa.
Hammond Brass Wks., Hammond, Ind.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Tin lined)
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Moran Flexible Joint Co., Louisville, Ky. (Distillery)
Morrison Brothers Co., Dubuque, Ia. (for oil handling)
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockford Brass Works, Rockford, Ill.
Schaible Co., The, Cincinnati, O.
Scott Valve Mfg. Co., Detroit, Mich.
Stockham Valves & Fittings Co., Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, GATE, IRON BODY

Bordo Co., Inc., L. J., Glenside, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin lined)
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Stockham Valves & Fittings Co., Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Valve Div. of ACF Industries, Detroit, Mich.
Walworth Co., New York, N. Y.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, GATE, MALLEABLE IRON

Bordo Co., Inc., L. J., Glenside, Pa.
Crane Co., Chicago, Ill.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Powell Co., Wm., The, Cincinnati, O.

VALVES, GATE, STEEL

Alco Products, Inc., Schenectady, N. Y.
Allegheny Valve Co., Warren, Pa.
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Bordo Co., Inc., L. J., Glenside, Pa.
Cameron Iron Works, Inc., Houston, Tex.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Edward Valves, Inc., East Chicago, Ind.
Everlasting Valve Co., Jersey City, N. J.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hamer Valves, Inc., Long Beach, Calif.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead lined)
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Stockham Valves & Fittings Co., Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, GLOBE, ALLOY

Alloy Steel Products Co., Linden, N. J.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Carpenter Valve Corp., The, Cleveland, O.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Electric Steel Foundry Co., Portland, Ore.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
LaBour Co., Inc., The, Elkhart, Ind.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
Republic Mfg. Co., Cleveland, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Strahman Valves, Inc., New York, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, GLOBE, ALUMINUM

Dahl, G. W., Bristol, R. I.
Hasco Valve & Machine Co., Milwaukee.
Powell Co., Wm., The, Cincinnati, O.
Republic Mfg. Co., Cleveland, O.

VALVES, GLOBE, BRASS AND BRONZE

American Brass Co., Waterbury, Conn.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Belknap Mfg. Co., Bridgeport, Conn.
California Brass Mfg. Co., Los Angeles.
Carpenter Valve Corp., The, Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Cleveland Brass Mfg. Co., The, Cleveland, O.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., St. Louis, Mo.
Detroit Brass & Malleable Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
Fairbanks Co., The, New York, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Wks., Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Morse-Smith Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Rockford Brass Works, Rockford, Ill.
Scott Valve Mfg. Co., Detroit, Mich.
Schaible Co., The, Cincinnati, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Stockham Valves & Fittings Co., Birmingham, Ala.
Strahman Valves, Inc., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh.
Taylor Instrument Companies, Rochester, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco.
Walworth Co., New York, N. Y.
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, GLOBE, IRON BODY

Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Dersch, Gesswein & Neuert, Inc., Chicago.

Fairbanks Co., The, New York, N. Y.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Co., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lunkenheimer Co., Cincinnati, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nason Co., Clarkston, Mich.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Shank Co., Cyrus, Chicago, Ill.
Stockham Valves & Fittings Co., Birmingham, Ala.
Strahman Valves, Inc., New York, N. Y.
Taylor Instrument Companies, Rocnester, N. Y.
Walworth Co., New York, N. Y.

VALVES, GLOBE, MALLEABLE IRON

Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Powell Co., Wm., The, Cincinnati, O.
Walworth Co., New York, N. Y.

VALVES, GLOBE, STEEL

Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
De Zurik Shower Co., Sartell, Minn.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Co., Industrial Div., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Richmond Foundry & Mfg. Co., Inc., The, Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Shank Co., Cyrus, Chicago, Ill.
Strahman Valves, Inc., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Velan Engineering Co., Montreal, Canada
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, INSTRUMENT

Associated Valve & Engineering Co., Chicago, Ill.
Autoclave Engineers, Inc., Erie, Pa.
Automatic Switch Co., Orange, N. J.
Bristol Co., The, Waterbury, Conn.
Carpenter Valve Corp., The, Cleveland, O.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., St. Louis, Mo.
Edward Valves, Inc., East Chicago, Ind.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Imperial Brass Mfg. Co., Chicago, Ill.
Keckley Co., O. C., Skokie, Ill.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
Republic Mfg. Co., Cleveland, O.
Roylyn, Inc., Glendale, Calif.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Trerice Co., H. O., Detroit, Mich.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, LINED

American Hard Rubber Co., New York, N. Y. (Rubber lined)
Automatic Switch Co., Orange, N. J.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Division Lead Co., Summit, Ill.
Fabri-Valve Co. of America, Portland, Ore.
Farris Flexible Valve Corp., Palisades Park, N. J.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Goodrich Co., B. F., Akron, O. (Rubber lined)
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (Rubber)
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead lined)
National Lead Co., New York, N. Y. (Lead)
P-K Industries, Inc., North Arlington, N. J.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R.K.L. Valve & Mfg. Co., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (Lead)
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Saran Lined Pipe Co., Ferndale, Mich. (Saran lined)
Smith Co., S. Morgan, York, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.

VALVES, MIXING, HOT AND COLD WATER

Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Dole Valve Co., The, Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
General Fittings Co., East Greenwich, R. I.
Hammel-Dahl Co., Providence, R. I.
Holby Tempering Valve Co., New York, N. Y.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Radiant Utilities Corp., Brooklyn, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
Strahman Valves, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Webster & Co., Warren, Camden, N. J.
Yula Water Heaters, Inc., Bronx, N. Y.

VALVES, MIXING, HOT AND COLD WATER, THERMOSTATIC

Jordon Corp., Cincinnati, O.
Lawler Automatic Controls, Inc., Mt. Vernon, N. Y.
Powers Regulating Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
Yula Water Heaters, Inc., Bronx, N. Y.

VALVES, MIXING, STEAM AND WATER

Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hammel-Dahl Co., Providence, R. I.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Screw Machine Products Co., Portland, Ore.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Strahman Valves, Inc., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Vapor Heating Corp., Chicago, Ill.

VALVES, MOTOR OPERATED

Alloy Steel Products Co., Linden, N. J. (stainless steel)
Associated Valve & Engineering Co., Chicago, Ill.
Au-Temp-Co Corp., New York, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Belco Industrial Equipment Div., Bogue Electrical Mfg. Co., Paterson, N. J.
Bell & Gossett Co., Morton Grove, Ill.
Bristol Co., The, Waterbury, Conn.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Clow & Sons, James B., Chicago, Ill.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Philadelphia, Pa.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.
De Zurik Shower Co., Sartell, Minn.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy only)
Heat-Timer Corp., New York, N. Y.
Hills-McCanna Co., Chicago, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Keckley Co., O. C., Skokie, Ill.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Mason-Neilan Regulator Co., Boston, Mass.
Mercoid Corp., Chicago, Ill.

Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
North American Mfg. Co., Cleveland, O.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Smith Co., S. Morgan, York, Pa.
Squires Co., C. E., The, Cleveland, O.
Stockham Valves & Fittings Co., Birmingham, Ala.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Techniflex Corp., Port Jervis, N. Y.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Warren Engineering Co., Broadway, N. J.
Webster & Co., Warren, Camden, N. J.
Wedgeplug Valve Co., Inc., New Orleans, La.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, NEEDLE

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
A-P Controls Corp., Milwaukee, Wis. (Oil)
Allin Mfg. Co., Inc., Chicago, Ill.
Alloy Steel Products Co., Linden, N. J. (Stainless steel)
American Meter Co., Inc., Philadelphia, Pa.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Carpenter Valve Corp., The, Cleveland, O. (Stainless steel stem, brass bar stock body)
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Cooper Alloy Corp., Hillside, N. J.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Detroit Brass & Malleable Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
Edward Valves, Inc., East Chicago, Ind.
Fairbanks Co., The, New York, N. Y.
Fisher Governor Co., Marshalltown, Ia.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Maid-O'-Mist, Inc., Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Modern Engineering Co., St. Louis, Mo.
Morrison Brothers Co., Dubuque, Ia. (for oil handling)
Mueller Brass Co., Port Huron, Mich.
Norgren Co., C. A., Englewood, Colo.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Research Vacuum Supply Co., Chicago, Ill.
Schaible Co., The, Cincinnati, O.
Security Valves Corp., Glendale, Calif.
Shank Co., Cyrus, Chicago, Ill.
Stockham Valves & Fittings Co., Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Torit Mfg. Co., St. Paul, Minn.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Cleveland, O.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, OXYGEN

Carpenter Valve Corp., The, Cleveland, O.
Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt & Son, Inc., C. B., Salem, O.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Modern Engineering Co., St. Louis, Mo.
Ohio Injector Co., Wadsworth, O.
Oxygen Equipment & Service Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Stockham Valves & Fittings Co., Birmingham, Ala.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Valco, Inc., Cincinnati, O.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Inc., New Orleans, La.

VALVES, PLASTIC

American Agile Corp., Bedford, O.
Atlas Mineral Products Co., Mertztown, Pa.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Colonial Plastics Mfg. Co., Cleveland, O. (Diaphragm valves)
Goodrich Co., B. F., Akron, O.
Hartwell & Son, Inc., H. N., Boston, Mass. (PVC)
Haveg Corp., Newark, Del.
Hills-McCanna Co., Chicago, Ill.
Lunkenheimer Co., Cincinnati, O. (PVC)
Roylyn, Inc., Glendale, Calif.
Saran Lined Pipe Co., Ferndale, Mich.
Seelye Craftsman, Minneapolis, Minn.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Tube Turns Plastics Inc., Louisville, Ky. (PVC)
Van Dorn Iron Works, Cleveland, O. (diaphragm)
Vanton Pump & Equipment Corp., Hillside, N. J.
Walworth Co., New York, N. Y.
Wilmington Plastics Co., Wilmington, Del.

VALVES, PLUG

American Car & Foundry Co., New York, N. Y.
Andale Co., Philadelphia, Pa.
Barrett, Haentjens & Co., Hazleton, Pa.
Barrett Machine Co., Pittsburgh, Pa.
Bordo Co., Inc., L. J., Glenside, Pa.
Cameron Iron Works, Inc., Houston, Tex.
Clow & Sons, James B., Chicago, Ill.
Cooper Alloy Corp., Hillside, N. J.
Corning Glass Works, Corning, N. Y.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
De Zurik Shower Co., Sartell, Minn. (rubber faced)
Duriron Co., Inc., Dayton, O. (Acid resisting)
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Faber Engineering Co., Inc., Philadelphia, Pa.
Fabri-Valve Co. of America, Portland, Ore.
General Ceramics Corp., Keasbey, N. J. (Chemical stoneware & porcelain)
Gilbert Brass Foundry Co., St. Louis, Mo.
Hamer Valves Inc., Long Beach, Calif.
Hasco Valve & Machine Co., Milwaukee, Wis.
Hays Mfg. Co., Erie, Pa.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Knight, Maurice A., Akron, O. (Stoneware)
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Reynolds Shaffer Co., Detroit, Mich.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa. (lubricated)
Saran Lined Pipe Co., Ferndale, Mich. (Saran lined)
Smith Co., S. Morgan, York, Pa.
Stockham Valves & Fittings Co., Birmingham, Ala.
Taylor Instrument Companies, Rochester, N. Y.
Texsteam Corp., Houston, Tex. (non-lubricated)
Thermac Co., Los Angeles, Calif.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J. (plastic)
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Cleveland, O.
Wedgeplug Valve Co., Inc., New Orleans, La.
Welsbach Corp., The, Kitson Div., Philadelphia, Pa.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, PRESSURE REDUCING AND REGULATING, AIR AND GAS

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
A-P Controls Corp., Milwaukee, Wis.
American Car & Foundry Co., New York.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Autoclave Engineers, Inc., Erie, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
CCA Products, Inc., Glendale, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Philadelphia, Pa.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.

d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
DeVilbiss Co., The, Toledo, O.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hammel-Dahl Co., Providence, R. I.
Hanna Engineering Wks., Chicago, Ill.
Harris Calorific Co., The, Cleveland, O.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Jordan Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Liquid Carbonic Corp., The, Chicago, Ill.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Regulator Co., Boston, Mass.
Maxitrol Co., Detroit, Mich.
McAlear Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co. Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Norgren Co., C. A., Englewood, Colo.
Norwalk Valve Co., South Norwalk, Conn.
P-K Industries, Inc., North Arlington, N. J.
Powers Regulator Co., Skokie, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., Cleveland, O.
Strong, Carlisle & Hammond Co., Cleveland, O.
Sullivan Valve & Engineering Co., Butte, Mont.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Tryco Products, Inc., Westfield, Mass.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

VALVES, PRESSURE REDUCING AND REGULATING, HOT WATER

A-P Controls Corp., Milwaukee, Wis.
Airmatic Valve Inc., Cleveland, O.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Philadelphia, Pa.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dunham Co., C. A., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Hammel-Dahl Co., Providence, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Powers Regulator Co., Skokie, Ill.
Quality Specialty Co., Inc., Camden, N. J.
Republic Flow Meters Co., Chicago, Ill.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schaible Co., The, Cincinnati, O.
Scientific Instrument Co., Detroit, Mich.
Spence Engineering Co., Inc., Walden, N. Y.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond Co., Cleveland, O.
Swartwout Co., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Vapor Heating Corp., Chicago, Ill.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
White Flomatic Corp., Hoosick Falls, N. Y.

VALVES, PRESSURE REDUCING AND REGULATING, STEAM

Aerco Corp., Northvale, N. J.
Airmatic Valve, Inc., Cleveland, O.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Philadelphia, Pa.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dunham Co., C. A., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hammel-Dahl Co., Providence, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island, N. Y.
P-K Industries, Inc., North Arlington, N. J.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond Co., Cleveland, O.
Swartwout Co., The, Cleveland, O.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corps., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

VALVES, PUMP

Anchor Packing Co., Philadelphia, Pa.
Burrows Mfg. Co., F. A., York, Pa.
Cla-Val Co., Newport Beach, Calif.
Defender Instrument & Regulator Co., St. Louis, Mo.
Durabla Mfg. Co., New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Garlock Packing Co., Palmyra, N. Y.
Goodrich Co., B. F., Akron, O.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jacuzzi Bros., Inc., Richmond, Calif.
Madden Corp., The, Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Sims Pump Valve Co., Hoboken, N. J.
United States Rubber Company, New York, N. Y.
Watts Regulator Co., Lawrence, Mass.
Webster Electric Co., Racine, Wis.
Westinghouse Air Brake Div., Pittsburgh, Pa. (anti-surge)
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

VALVES, QUICK OPENING

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Barksdale Valves, Los Angeles, Calif.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Defender Instrument & Regulator Co., St. Louis, Mo.
Dole Refrigerating Co., Chicago, Ill.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Farris Flexible Valve Corp., Palisades Park, N. J.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Grinnell Co., Inc., Providence, R. I.
Hamer Valves, Inc., Long Beach, Calif.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Hasco Valve & Machine Co., Milwaukee.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Klipfel Valves, Inc., Hamilton, O.
Lunkenheimer Co., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.

McRae Corp., Glendale, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Nason Co., Clarkston, Mich.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
OPW Corp., Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R.K.L. Valve & Mfg. Co., Philadelphia, Pa.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Rockwood Sprinkler Co., Worcester, Mass.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Stockham Valves & Fittings Co., Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, RADIATOR, AIR, FOR HOT WATER RADIATORS

Anderson Products, Inc., Cambridge, Mass.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Dole Valve Co., The, Chicago, Ill.
G & H Mfg. Co., Philadelphia, Pa.
Hammond Brass Wks., Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Keeney Mfg. Co., Newington, Conn.
Maid-O'Mist, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
New York Air Valve Corp., Brooklyn, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Quality Specialty Co., Inc., Camden, N. J.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.

VALVES, RADIATOR, AIR, FOR STEAM RADIATORS

Anderson Products, Inc., Cambridge, Mass.
Bridgeport Brass Co., Bridgeport, Conn.
Detroit Controls Corp., Detroit, Mich.
Dole Valve Co., The, Chicago, Ill.
Gorton Heating Co., Cranford, N. J.
Hammond Brass Wks., Hammond, Ind.
Heat-Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Keeney Mfg. Co., Newington, Conn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
New York Air Valve Corp., Brooklyn, N. Y.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
Riggio Co., Frank D., Rutherford, N. J.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, ELECTRIC

Barber-Colman Co., Rockford, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Jenkins Bros., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sarcotherm Controls, Inc., New York, N. Y.
Vapor Heating Corp., Chicago, Ill.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, PACKLESS

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, PNEUMATIC

Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, SELF-CONTAINED

Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E. The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trane Co., The, LaCrosse, Wis.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, SELF-CONTAINED, PACKLESS

Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.

VALVES, RADIATOR, ORIFICE

Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham Co., C. A., Chicago, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Marsh Valve Co., Dunkirk, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Trane Co., The, LaCrosse, Wis.
Webster & Co., Warren, Camden, N. J.

VALVES, RADIATOR, STEAM AND HOT WATER, HAND

Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Detroit Controls Corp., Detroit, Mich.
Dunham Co., C. A., Chicago, Ill.
Fairbanks Co., The, New York, N. Y.
Haines Div., William S., Sellers Injector Corp., Philadelphia, Pa.
Hammond Brass Wks, Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Powell Co., Wm., The, Cincinnati, O.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
Scott Valve Mfg. Co., Detroit, Mich.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trane Co., The, La Crosse, Wis.
United States Radiator Corp., Detroit, Mich.
Webster & Co., Warren, Camden, N. J.

VALVES, RADIATOR, STEAM AND HOT WATER, MODULATING

Barber-Colman Co., Rockford, Ill.
Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham Co., C. A., Chicago, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Haines Div., William S., Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Ohio Brass Co., Mansfield, O.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling Inc., Milwaukee, Wis.
Vapor Specialty Co., New York, N. Y.
Webster & Co., Warren, Camden, N. Y.

VALVES, REFRIGERATION (ANGLE, CHECK, GATE, GLOBE, NEEDLE, RELIEF)

A-P Controls Corp., Milwaukee, Wis.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Farris Engineering Corp., Palisades Park, N. J.
Frick Co., Waynesboro, Pa.
Hammel-Dahl Co., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Hills-McCanna Co., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Marsh Instrument Co., Skokie, Ill.
Mueller Brass Co., Port Huron, Mich.
Reynolds Mfg. Co., Inc., Springfield, Mo.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.

VALVES, REFRIGERATION, BACK PRESSURE

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Electrimatic Co., Sales Affiliate, Jas. P. Marsh Corp., Skokie, Ill.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Hammel-Dahl Co., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Lonergan Co., J. E., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
Schnacke, Inc., Evansville, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Temprite Products Corp., Birmingham, Mich.
Vilter Mfg. Co.; The, Milwaukee, Wis.
X L Refrigerating Co., Chicago, Ill.

VALVES, REFRIGERATION, EXPANSION, CONSTANT PRESSURE

A-P Controls Corp., Milwaukee, Wis.
Alco Co., St. Louis, Mo.
Cash Co., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Detroit Controls Corp., Detroit, Mich.
Foster Engineering Co., Union, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Hammel-Dahl Co., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
Lonergan Co., J. E., Philadelphia, Pa.
Mayson Mfg. Co., Detroit, Mich.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., The, Milwaukee, Wis.
X L Refrigerating Co., Chicago, Ill.

VALVES, REFRIGERATION, EXPANSION, THERMOSTATIC

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.

Detroit Controls Corp., Detroit, Mich.
Frigidaire Div., General Motors Corp., Dayton, O.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Mayson Mfg. Co., Detroit, Mich.
Peerless of America, Inc., Chicago, Ill.
Sporlan Valve Co., St. Louis, Mo.
Tenney Engineering, Inc., Union, N. J.
X L Refrigerating Co., Chicago, Ill.

VALVES, REFRIGERATION, FLOAT, HIGH PRESSURE

Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Armstrong Machine Works, Three Rivers, Mich.
Foster Engineering Co., Union, N. J.
Frick Co., Waynesboro, Pa.
Hubbell Corp., Mundelein, Ill.
Mercoid Corp., Chicago, Ill.
Phillips & Co., H. A., Chicago, Ill.
Temprite Products Corp., Birmingham, Mich.
Vilter Mfg. Co., Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
York Corp., York, Pa.

VALVES, REFRIGERATION, FLOAT, HIGH PRESSURE AND LOW PRESSURE

Mayson Mfg. Co., Detroit, Mich.
Phillips & Co., H. A., Chicago, Ill.
Temprite Products Corp, Birmingham, Mich.
Vilter Mfg. Co., Milwaukee, Wis.
Voss Co., J. H. H., Inc., New York, N. Y.
York Corp., York, Pa.

VALVES, REFRIGERATION, LIQUID CONTROL, FLOAT PILOTED

Alco Valve Co., St. Louis, Mo.
Defender Instrument & Regulator Co., St. Louis, Mo.
Frick Co., Waynesboro, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Magnetro, Inc., Chicago, Ill.
Phillips & Co., H. A., Chicago, Ill.
York Corp., York, Pa.

VALVES, REFRIGERATION, MAGNETIC STOP

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Automatic Switch Co., Orange, N. J.
Detroit Controls Corp, Detroit, Mich.
Electrimatic Co., Sales Affiliate, Jas. P. Marsh Corp., Skokie, Ill.
Frick Co., Waynesboro, Pa.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hubbell Corp., Mundelein, Ill.
Mercoid Corp., Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Sporlan Valve Co., St. Louis, Mo.

VALVES, REFRIGERATION, TEMPERATURE REGULATING OR SNAP ACTION SUCTION

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Frigidaire Div., General Motors Corp., Dayton, O.
Hubbell Corp., Mundelein, Ill.
Temprite Products Corp., Birmingham, Mich.

VALVES, REFRIGERATION, WATER REGULATING, PRESSURE OR TEMPERATURE ACTUATED

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Art Valve Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Electrimatic Co., Sales Affiliate, Jas. P. Marsh Corp., Skokie, Ill.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Jordan Corp., Cincinnati, O.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Mfg. Co., Hamilton, O.
Mayson Mfg. Co., Detroit, Mich.
Mercoid Corp., Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Spence Engineering Co., Inc., Walden, N. Y.
York Corp., York, Pa.

VALVES, RELIEF, HOT WATER, COMBINED PRESSURE AND TEMPERATURE OPERATED

Atlas Valve Co., Newark, N. J.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.
Dole Valve Co., The, Chicago, Ill
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Kunkle Valve Co., Ft. Wayne, Ind.
McDonnell & Miller, Inc., Chicago, Ill.
Mueller Co., Decatur, Ill.
New York Air Valve Corp., Brooklyn, N. Y.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Schaible Co., The, Cincinnati, O.
Thrush & Co., H. A. Peru, Ind.
Trane Co., The, La Crosse, Wis.
Watts Regulator Co., Lawrence, Mass.
Welsbach Corp., The, Kitson Div., Philadelphia, Pa.

VALVES, RELIEF, HOT WATER, PRESSURE OPERATED

Ashton Valve Co., Wrentham, Mass.
Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cla-Val Co., Newport Beach, Calif.
Cochrane Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill
Dole Valve Co., The, Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.
Durabla Mfg. Co., New York, N. Y.
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jordan Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kehm Corp., The, Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Kunkle Valve Co., Ft. Wayne, Ind.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McDonnell & Miller, Inc., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Multiplex Mfg. Co., Berwick, Pa.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schaible Co., The, Cincinnati, O.
Scott Valve Mfg. Co., Detroit, Mich.
Swartwout Co., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Texsteam Corp., Houston, Tex.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Tryco Products, Inc., Westfield, Mass.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Welsbach Corp., The, Kitson Div., Philadelphia, Pa.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

VALVES, RELIEF, HOT WATER, PRESSURE OPERATED, SELF-FILLING

Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Kehm Corp., The, Chicago, Ill.
Klipfel Valves, Inc., Hamilton, O.
McDonnell & Miller, Inc., Chicago, Ill.
Mueller Co., Decatur, Ill.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

VALVES, RELIEF, HYDRAULIC

Ashton Valve Co., Wrentham, Mass.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Blackhawk Mfg. Co., Milwaukee, Wis.
Cameron Iron Works, Inc., Houston, Tex.
Carpenter Valve Corp., The, Cleveland, O.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cla-Val Co., Newport Beach, Calif.
Commercial Shearing & Stamping Co., Youngstown, O.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Farris Engineering Corp., Palisades Park, N. J.
Foster Engineering Co., Union, N. J.
Fulflo Specialties Co., Inc., The, Blanchester, O.
General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
James-Pond-Clark, Pasadena, Calif.
Keckley Co., O. C., Skokie, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kunkle Valve Co., Ft. Wayne, Ind.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonnell & Miller, Inc., Chicago, Ill.
Pantex Mfg. Corp., Hydraulic Div., Pawtucket, R. I.
Republic Mfg. Co., Cleveland, O.
Ross Valve Mfg. Co., Troy, N. Y.
Scott Valve Mfg. Co., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.
Wilson Co., K. R., Arcade, N. Y.

VALVES, RELIEF, OIL

American Car & Foundry Co., New York, N. Y.
Andale Co., Philadelphia, Pa.
Ashton Valve Co., Wrentham, Mass.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cla-Val Co., Newport Beach, Calif.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Davis Regulator Corp., Chicago, Ill.
Durabla Mfg. Co., New York, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Greer Hydraulics, Inc., Jamaica, N. Y.

Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
James-Pond-Clark, Pasadena, Calif.
Keckley Co., O. C., Skokie, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Kunkle Valve Co., Ft. Wayne, Ind.
Lancaster Heat Transfer Co., Inc., Brooklyn.
Locke Regulator Co., Salem, Mass.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Morrison Brothers Co., Dubuque, Ia. (for oil handling)
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Pantex Mfg. Corp., Hydraulics Div., Pawtucket, R. I.
Preferred Utilities Mfg. Corp., New York, N. Y.
Republic Mfg. Co., Cleveland, O.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Staples & Pfeiffer, San Francisco, Calif.
Texsteam Corp., Houston, Tex.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Watson & McDaniel Co., Philadelphia, Pa.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, SADDLE

Beckett & Co., Inc., Thomas, Dallas, Tex.
Darling Valve & Mfg. Co., Williamsport, Pa.
Fairbanks Co., The, New York, N. Y.
Imperial Brass Mfg. Co., Chicago, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Madden Brass Products Co., Aurora, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
Okadee Co., Chicago, Ill.
Walworth Co., New York, N. Y.

VALVES, SAFETY CLEANOUT

Liquidepth Indicators, Inc., Long Island City, N. Y.

VALVES, SAFETY, STEAM

American Car & Foundry Co., New York, N. Y.
Ashton Valve Co., Wrentham, Mass.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Engineering Corp., Palisades Park, N. J.
Foster Engineering Co., Union, N. J.
Keckley Co., O. C., Skokie, Ill.
Kunkle Valve Co., Ft. Wayne, Ind.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
McRae Corp., Glendale, Calif.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Powell Co., Wm., The, Cincinnati, O.
Scott Valve Mfg. Co., Detroit, Mich.
Texsteam Corp., Houston, Tex.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vapor Heating Corp., Chicago, Ill.
Vernon Tool Co., Ltd., Alhambra, Calif.

VALVES, SLIDE

Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Fabri-Valve Co. of America, Portland, Ore.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware)
General Controls Co., Glendale, Calif.
Jenkins Bros., New York, N. Y.
Ohio Injector Co., Wadsworth, O.
Rockwell Co., W. S., Fairfield, Conn.
Walworth Co., New York, N. Y.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, SOLDER JOINT

American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Cleveland Brass Mfg. Co., The, Cleveland, O.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Detroit Brass & Malleable Co., Detroit, Mich.
Fairbanks Co., The, New York, N. Y. (also brazed-end)
Hammond Brass Works, Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York., N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Ohio Brass Co., Mansfield, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Valco, Inc., Cincinnati, O.
Walworth Co., New York, N. Y. (Silver brazed)

VALVES, SOLENOID

A-P Controls Corp., Milwaukee, Wis.
Airmatic Valve, Inc., Cleveland, O.
Alco Valve Co., St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Associated Valve & Engineering Co., Chicago, Ill.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Orange, N. J.
Barber-Colman Co., Rockford, Ill.
Barksdale Valves, Los Angeles, Calif.
Clark Controller Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Davis Regulator Co., Chicago, Ill.
Detroit Controls Corp., Detroit, Mich.
Dole Valve Co., The, Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electrimatic Co., Sales Affiliate, Jas. P. Marsh Corp., Skokie, Ill.
Erickson Specialty Co., Cohoes, N. Y.
Farris Flexible Valve Corp., Palisades Park, N. J.
Frick Co., Waynesboro, Pa.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Gould Co., J. D., Indianapolis, Ind.
Grove Valve and Regulator Co., Oakland, Calif.
Hanna Engineering Wks., Chicago, Ill.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)
Hays Mfg. Co., Erie, Pa.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hook & Ackerman, Inc., New York, N. Y.
Hubbell Corp., Mundelein, Ill.
Hunt & Son, Inc., C. B., Salem, O.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
Johnson Corp., The, Three Rivers, Mich.
Keckley Co., O. C., Skokie, Ill.
Lammert & Mann Co., Chicago, Ill. (Gas safety shut-off)
Ledeen Mfg. Co., Los Angeles, Calif.
Locke Regulator Co., Salem, Mass.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Instrument Co., Skokie, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
McQuay-Norris Mfg. Co., St. Louis, Mo.
McRae Corp., Glendale, Calif.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia
Nicholson & Co., W. H., Wilkes-Barre, Pa.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Security Valves Corp., Glendale, Calif.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Soreng Products Corp., Schiller Park, Ill.
Spence Engineering Co., Walden, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Supreme Electric Products Corp., Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Vapor Heating Corp., Chicago, Ill.
Webster Electric Co., Racine, Wis.
White-Rodgers Electric Co., St. Louis, Mo.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, STEAM-JACKETED

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Associated Valve & Engineering Co., Chicago, Ill.
Barrett Machine Co., Pittsburgh, Pa.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Everlasting Valve Co., Jersey City, N. J.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Parks-Cramer Co., Fitchburg, Mass.
Powell Co., Wm., The, Cincinnati, O.
Red Jacket Co., Inc., Carnegie, Pa.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Inc., New Orleans, La.

VALVES, 2, 3 AND 4 WAY

Airmatic Valve, Inc., Cleveland, O.
Alco Valve Co., St. Louis, Mo.
American Car & Foundry Co., New York, N. Y.
Aqua Matic, Inc., Rockford, Ill.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Barksdale Valves, Los Angeles, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bordo Co., Inc., L. J., Glenside, Pa.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Controller Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Commercial Shearing & Stamping Co., Youngstown, O.
Crane Co., Chicago, Ill.
Davis Engineering Corp., Elizabeth, N. J.
Davis Regulator Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Detroit Brass & Malleable Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
De Zurik Shower Co., Sartell, Minn.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Fisher Governor Co., Marshalltown, Ia.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hammel-Dahl Co., Providence, R. I.
Hanna Engineering Wks., Chicago, Ill.
Henry Valve Co., Melrose Park, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt & Son, Inc., C. B., Salem, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Ledeen Mfg. Co., Los Angeles, Calif.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
McDonald Mfg. Co., A. Y., Dubuque, Ia.

Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Ohio Brass Co., Mansfield, O.
Penn Controls, Inc., Goshen, Ind.
Permutit Co., New York, N. Y.
Powell Co., Wm., Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
Republic Mfg. Co., Cleveland, O.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarcotherm Controls, Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemicals & Dye Corp., New York, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Wach Co., E. H., The, Chicago, Ill.
Walworth Co., New York, N. Y. (Lubricated plug valves)
Warren Engineering Co., Broadway, N. J.
Weatherhead Co., The, Cleveland, O.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, WATER GAGE

Associated Valve & Engineering Co., Chicago, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.
Ernst Water Column & Gauge Co., Livingston, N. J.
Keckley Co., O. C., Skokie, Ill.
Lonergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Security Valves Corp., Glendale, Calif.

VANES, DUCT TURNING, PREFABRICATED

Anemostat Corp. of America, New York, N. Y. (Equalizing deflectors)
Barber-Colman Co., Rockford, Ill.
Carey Mfg. Co., Philip, The, Lockland, Cincinnati, O.
Duro-Dyne Corp., New Hyde Park, L. I. N. Y.
Elgen Mfg. Corp., Long Island City, N. Y.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Inc., New Britain, Conn.
Waterloo Register Co., Inc., Waterloo, Iowa

VAPOR HEATING SYSTEMS

See Systems, Heating, Vapor

VAPORIZERS FOR PROPANE-BUTANE

Buxton Mfg. Co., Dover, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Mitchell Co., John E., Dallas, Tex.
Mutual Liquid Gas & Equipment Co., Gardena, Calif.
Ransome Co., Emeryville, Calif.

VARIABLE SPEED DRIVES

See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical; Reducers, Speed; Pulleys and Sheaves, for Belt Drives

VARIABLE SPEED PULLEYS

See Changers, Speed, Mechanical

V-BELT DRIVES

See Drives, V-Belt

VELOCITY, REGULATORS

See Regulators, Air Velocity

VENT FLUE CAPS

See Caps, Vent Flue

VENTILATING HOSE

See Ducts and Duct Fittings, Prefabricated, Flexible, Metallic, and Non-Metallic

VENTILATION HEATERS

See Surface, Finned, Heating; Ventilators, Roof, Fan; Ventilators, Unit

VENTILATORS, MUSHROOM

Burt Mfg. Co., Akron, O.
Carnes Corp., Verona, Wis.
Chicago Blower Corp., Franklin Park, Ill.
Cook Co., Loren, Berea, O.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Flex-Air, Inc., Los Angeles, Calif.
Jenn-Air Products Co., Indianapolis, Ind.
Knight, Maurice A., Akron, O. (Stoneware)
Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Martin Fan & Blower Co., Chicago, Ill.
Muckle Mfg. Co., Owatonna, Minn.
Peerless Electric Co., Warren, O.
Penn Ventilator Co., Philadelphia, Pa.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
University Fan & Blower Co., Berkeley, Calif.
Uno Ventilator Co., Malden, Mass.
Van Noorden Co., E., Boston, Mass.

VENTILATORS, ROOF, FAN

Acme Equipment Co., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Airjet Ventilator Co., El Monte, Calif.
Aladdin Heating Corp., San Leandro, Calif.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Blower Corp., Detroit, Mich.
American Steel Band Co., Pittsburgh, Pa.
Ammerman Co., C. L., Minneapolis, Minn.
Arex Co., Chicago, Ill.
Atmos Corp., Chicago, Ill.
Bar-Brook Mfg. Co., Inc., Shreveport, La.
Bertram Co., Harvey P., The, Cincinnati, O.
Bishop & Babcock Mfg. Co., Cleveland, O.
Breidert Co., G. C., San Fernando, Calif.
Brookside Products Co., Inc., McCordsville, Ind.
Burt Mfg. Co., Akron, O.
Carnes Corp., Verona, Wis.
Century Fan & Ventilator Co., Stamford, Conn.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Chelsea Products, Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Clay Equipment Corp., Cedar Falls, Ia.
Commercialaire, Inc., Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
Dana Fan & Blower Corp., Cincinnati, O.
Davidson Hyduty Roof Fan Co., Newton, Mass.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Donaldson Div., Marvin D. Shafer Co., Inc., Los Angeles, Calif.
Donaldson Power Ventilator Co., N. Hollywood, Calif.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Flex-Air Inc., Los Angeles, Calif.
Gallaher Co., The, Owatonna, Minn., & Omaha, Neb.
Gehri Co., Tacoma, Wash.
General Blower Co., Morton Grove, Ill.
Genie-Air, Los Angeles, Calif.
Hartzell Propeller Fan Co., Piqua, O.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Heating Assurance, Inc., Spokane, Wash.
Hill Co., Francis, Cleveland, O.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Ilg Electric Ventilating Co., Chicago, Ill.
International Engineering, Inc., Dayton, O.
Iona Ventilator Co., Inc., Philadelphia, Pa.
Iron Lung Ventilator Co., Cleveland, O.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
King Co. of Owatonna, The, Owatonna, Minn.
Kody Blower Co., Trenton, N. J.
Lee & Son Co., Thomas, Cincinnati, O.
Loren Cook Co., Berea, O.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
Moore Co., The, Marceline, Mo.
Mountain States Equipment Co., Denver, Colo.
Muckle Mfg. Co., Owatonna, Minn.
New York Blower Co., Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Octagon Ventilator Co., Chicago, Ill.
Peerless Electric Co., Warren, O.
Penn Ventilating Co., Philadelphia, Pa.
Proctor & Schwartz, Inc., Philadelphia, Pa.
Propellair Div., Robbins & Myers Inc., Springfield, O.
Robertson Co., H. H., Pittsburgh, Pa.
Sargent Enginairing Co., Cleveland, O.
Somers, Inc., H. J., Detroit, Mich.
South Bend Air Products, Inc., South Bend, Ind.
Swartwout Co., The, Cleveland, O.
Trade-Wind Motorfans, Inc., Rivera, Calif.
Trane Co., The, La Crosse, Wis.
Tripar Products, Inc., Royal Oak, Mich.
Truflo Fan Co., Harmony, Pa.
University Fan & Blower Co., Berkeley, Calif.
Uno Ventilator Co., Malden, Mass.
Utility Fan Corp., Los Angeles, Calif.
Van Noorden Co., E., Boston, Mass.
Waverly Heating Supply Co., Boston, Mass.
Western Engineering & Mfg. Co., Venice, Calif.
Wind-Way Fan & Ventilator Co., New Orleans, La.
Wing Mfg. Co., L. J., Linden, N. J.

VENTILATORS, ROOF, GRAVITY

Accurate Sheet Metal Mfg. Works, Chicago.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Airjet Ventilator Co., El Monte, Calif.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Metal Works, Inc., New Orleans.
American Steel Band Co., Pittsburgh, Pa.
Ammerman Co., C. L., Minneapolis, Minn.
Arex Co., Chicago, Ill.
Bertram Co., Harvey P., The, Cincinnati, O.
Breidert Co., G. C., San Fernando, Calif.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilator Co., Stamford, Conn.
Clay Equipment Corp., Cedar Falls, Ia.
Donaldson Div., Marvin D. Shafer Co., Inc., Los Angeles, Calif.
Donaldson Power Ventilator Co., North Hollywood, Calif.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Gehri Co., Tacoma, Wash.
Greenheck Bros. Mfg. Co., Schofield, Wis.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Inland Steel Products Co., Milwaukee, Wis.
Iona Ventilator Co., Inc., Philadelphia, Pa.
International Metal Products, Phoenix, Ariz.
Iwan Brothers, South Bend, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Klauer Mfg. Co. Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lee & Son Co., Thomas, Cincinnati, O.
Leslie Welding Co., Inc., Chicago, Ill.
Levow, David, New York, N. Y.
Moeschl-Edwards Corrugating Co., Inc., The, Cincinnati, O.
Newcomb-Detroit Co., Detroit, Mich.
Octagon Ventilator Co., Chicago, Ill.
Penn Ventilating Co., Philadelphia, Pa.
Pioneer Roofing & Sheet Metal Co., Muskogee, Okla.
Plasteel Products Corp., Washington, Pa.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Robertson Co., H. H., Pittsburgh, Pa.
St. Paul Corrugating Co., St. Paul, Minn.
Sioux Steel Co., Sioux Falls, S. D.
Souther Iron Co., E. E., St. Louis, Mo.
Swartwout Co., The, Cleveland, O.
Tierney Rotor Ventilator Co., Minneapolis, Minn.
University Fan Blower Co., Berkeley, Calif.
Uno Ventilator Co., Malden, Mass.
Van Noorden Co., E., Boston, Mass.
Walker Jamar Co., Duluth, Minn.
Warner Ventilator Co., La Grange, Ind.
Waverly Heating Supply Co., Boston, Mass.

Western Engineering & Mfg. Co., Venice, Calif.
Willis Steel Corp., Galesburg, Ill.

VENTILATORS, ROOF, WITH FUSIBLE LINKS, FOR VENTING PRODUCTS OF COMBUSTION

American Metal Works, Inc., New Orleans, La.
Burt Mfg. Co., Akron, O.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Iona Ventilator Co., Inc., Philadelphia, Pa.
Swartwout Co., The, Cleveland, O.
University Fan & Blower Co., Berkeley, Calif.
Van Noorden Co., E., Boston, Mass.

VENTILATORS, UNIT

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Blazer & Son, M., Passaic, N. J.
Brookside Products Co., Inc., McCordsville, Ind.
Donaldson Div., Marvin D. Shafer Co., Inc., Los Angeles, Calif.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Nesbitt, Inc., John J., Philadelphia, Pa.
Norman Products Co., Inc., Columbus, O. (gas fired)
Trane Co., The, LaCrosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
Wesix Electric Heater Co., San Francisco, Calif. (Electric)
Wood Mfg. Co., A. R., Luverne, Mich.

VIBRATION ISOLATORS

See Absorbers, Vibration; Bases and Pads, Vibration Isolating; Hose, Flexible, Metal and Fittings

VISCOSIMETERS

American Instrument Co., Inc., Silver Spring, Md.
Brabender Corp., Rochelle Park, N. J. (recording)
Bristol Co., The, Waterbury, Conn.
Brookfield Engineering Laboratories, Inc., Stoughton, Mass.
Fischer & Porter Co., Hatboro, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Humboldt Mfg. Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Thomas Co., Arthur H., Philadelphia, Pa.
Ultra-Viscoson Corp., The, Hartford, Conn.
Will Corp., Rochester, N. Y.

VISES, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Austin Corp., Robert, Boston, Mass.
Beaver Pipe Tools, Inc., Warren, O. (Sawing—for tubing)
Billings & Spencer Co., Hartford, Conn.
Capewell Mfg. Co., Hartford, Conn.
Crown Die & Tool Corp., Chicago, Ill.
Desmond-Stephens Mfg. Co., Urbana, O.
Erie Tool Wks., Erie, Pa.
Hollands Mfg. Co., Erie, Pa.
Nye Tool Co., Chicago, Ill.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Springload Mfg. Corp., Seattle, Wash.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Vanderman Mfg. Co., Willimantic, Conn.
Western Wire Products Co., St. Louis, Mo.
Williams & Co., J. H., Buffalo, N. Y.
Yost Mfg. Co., Cambridge Springs, Pa.

VISES, SHEET METAL WORKERS'

Desmond-Stephan Mfg. Co., Urbana, O.
Yost Mfg. Co., Cambridge Springs, Pa.

WARM AIR FURNACES

See Furnaces, Warm Air

WASHERS, AIR

Air & Refrigeration Corp., New York, N. Y.
Air-Cooling Engineering Co., Evanston, Ill.
Air Fan Engineering Co., Los Angeles, Calif.
Alton Mfg. Co., Dallas, Tex.
American Blower Corp., Detroit, Mich.
Bahnson Co., Winston-Salem, N. C.
Bayley Blower Co., Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Burdett Mfg. Co., Chicago, Ill.
Carrier Corp., Syracuse, N. Y.
Centri-Spray Corp., Livonia, Mich. (Wet type)
Clarage Fan Co., Kalamazoo, Mich.
Comfort Products Corp., Dallas, Tex.
Continental Air Filters, Inc., Louisville, Ky.
Donaldson Div., Marvin D. Shafer Co., Inc., Los Angeles, Calif.
Donaldson Power Ventilator Co., North Hollywood, Calif.
Drying Systems, Inc., Chicago, Ill.
Ducon Co., The, Mineola, N. Y.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Mahon Co., R. C., The, Detroit, Mich.
Marlo Coil Co., St. Louis, Mo.
Mountain States Equipment Co., Denver, Colo.
Parks-Cramer Co., Fitchburg, Mass.
Peters-Dalton, Inc., Detroit, Mich.
Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Schmieg Industries, Detroit, Mich.
Schneible Co., Claude B., Detroit, Mich.
Silco Products, Inc., Minneapolis, Minn.
Spray Engineering Co., Somerville, Mass.
Surface Combustion Corp., Toledo, O.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Utility Appliance Corp., Los Angeles, Calif.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
York Corp., York, Pa.

WASHERS, FUME

Aqua-Therm, Inc., Dayton, O.
Burdett Mfg. Co., Chicago, Ill.
Carrier Corp., Syracuse, N. Y.
Centri-Spray Corp., Livonia, Mich. (wet type)
Ducon Co., The, Mineola, N. Y.
Heil Process Equipment Corp., Cleveland, O.
Knight Maurice A., Akron, Ohio (wet type)
Mahon Co., R. C., The, Detroit, Mich.
Oxy Catalyst, Inc., Wayne, Pa.
Schmieg Industries, Inc., Detroit, Mich.
Schneible Co., Claude B., Detroit, Mich.
Semet-Solvay Engineering Div., Allied Chemicals & Dye Corp., New York, N. Y.

WATER CHILLERS

See Chillers, Water, for Air Conditioning and Refrigeration, Compressors, Refrigerating, Combined with Condenser, Water Chiller, Piping Connections, and Controls

WATER DISTRIBUTORS FOR CONDENSERS

See Distributors, Water, for Condensers

WATER HAMMER ELIMINATORS

See Absorbers, Shock, Liquid

WATER RAMS FOR CLEANING OUT PIPE LINES

See Rams, Water

WATER TREATMENT

See Treatment, Water; Devices, Electrolytic, for Preventing Corrosion

WELD TESTING MACHINES

See Machines, Testing, Weld

WELDERS, ARC

Air Reduction Sales Co., New York, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Birdsell Mfg. Co., Inc., Palo Alto, Calif.
Borm Mfg. Co., Elgin, Ill.
Burdett Oxygen Co. of Calif., Huntington Park, Calif.
Eisler Engineering Co., Inc., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Ergolyte Mfg. Co., Philadelphia, Pa.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Fern, Ralph, Scranton, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hammett Electric Mfg. Co., Kansas City, Mo.
Harnischfeger Corp., Milwaukee, Wis.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Hobart Bros. Co., Troy, O.
Kern Co., John A., Chicago, Ill.
Lee Co., K. O., Aberdeen, S. D.
Lincoln Electric Co., Cleveland, O.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y. (Inert gas-shielded)
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Metal & Thermit Corp., New York, N. Y.
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Electric Mfg. Co., Inc., Appleton, Wis.
National Cylinder Gas Co., Chicago, Ill.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Precision Welder Mfg. Co., Chicago, Ill.
Sight Feed Generator Co., West Alexandria, O.
Smith Corp., A. O., Milwaukee, Wis.
Smith Welding Equipment Corp., Minneapolis, Minn.
Trindl Products, Ltd., Chicago, Ill.
Tweco Products Co., Wichita, Kan. (Cable connectors, electrode holders and accessories and welding cable)
United Specialty Corp., El Dorado, Ark. (welding cable reel)
Welding Apparatus Co., Chicago, Ill.
Weldit, Inc., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.
Will-Weld Mfg. Co., Inc., Omaha, Neb.

WELDERS, FOR PLASTIC PIPE OR PLASTIC SHEET

American Agile Corp., Bedford, O.
Saran Lined Pipe Co., Ferndale, Mich. (electric & acetylene types)
Seelye Craftsman, Minneapolis, Minn.

WELDERS, SPOT

Acme Electric Welder Co., Los Angeles, Calif.
Acro Welder Mfg. Co., Milwaukee, Wis.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alphil Spot Welding Co., Brooklyn, N. Y.
Birdsell Mfg. Co., Inc., Palo Alto, Calif.
Central Transformer Corp., Pine Bluff, Ark.
Delta Welder Corp., Detroit, Mich.
DoAll Co., The, Des Plaines, Ill.
Duro-Dyne Corp., New Hyde Park, L. I. N. Y. (portable)
Eisler Engineering Co., Inc., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Fern Ralph, Scranton, Pa.
Fire Gun Sales Corp., Denver, Colo.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y. (Inert gas-shielded arc)
Micro Products Co., Chicago, Ill.
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Electric Mfg. Co., Inc., Appleton, Wis.
National Cylinder Gas Co., Chicago, Ill.
Peer, Inc., Benton Harbor, Mich.
Research Vacuum Supply Co., Chicago, Ill.
Rex Welder Co., Kansas City, Mo.
Sciaky Bros., Inc., Chicago, Ill.
Taylor-Winfield Corp., Warren, O.
Thomson Electric Welder Co., Lynn, Mass.
Universal Power Corp., Cleveland, O.
Weldex, Inc., Detroit, Mich.
Weldit, Inc., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.

WELDERS, STUD

Eisler Engineering Co., Inc., Newark, N. J.
Graham Manufacturing Co., Royal Oak, Mich.
Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.
KSM Products, Inc., Merchantville, N. J.

WELDING AND CUTTING APPARATUS, OXY-ACETYLENE

Air Reduction Sales Co., New York, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Arcos Corp., Philadelphia, Pa. (arc-oxygen)
Atlas Welding Accessories Co., Ferndale, Mich. (Weld cleaning tools)
Dockson Corp., Detroit, Mich.
Evans Machine Co., Inc., Baltimore, Md.

Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Goss Gas, Inc., Pittsburgh, Pa.
Harris Calorific Co., The, Cleveland, O.
Industrial Gas Div., The Liquid Carbonic Corp., Chicago, Ill.
K-G Equipment Co., Allentown, Pa.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Liquid Carbonic Corp., The, Chicago, Ill.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Modern Engineering Co., St. Louis, Mo.
National Cylinder Gas Co., Chicago, Ill.
Sight Feed Generator Co., West Alexandria, O. (portable and stationary acetylene generators)
Smith Welding Equipment Corp., Minneapolis, Minn.
United Specialty Corp., El Dorado, Ark. (welding hose reel)
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.

WELDING COMPOUNDS

See Compounds, Welding

WELDING FUME COLLECTORS

See Exhausters, Welding Fume

WELLS, THERMOMETER

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Campbell Co., J. A., Long Beach, Calif.
Engelhard, Inc., Charles, East Newark, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
General Ceramics Corp., Keasbey, N. J.
Maloney Co., F. H., Houston, Tex.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Pacific Transducer Corp., Los Angeles, Calif.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Philadelphia Thermometer Co., Philadelphia.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Weksler Thermometer Corp., Freeport, N. Y.

WHEELS, BLOWER

Advance Aluminum Castings Corp., Chicago.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Air Fan Engineering Co., Los Angeles, Calif.
Barry Blower Co., Minneapolis, Minn.
Bayley Blower Co. Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Brundage Co., The, Kalamazoo, Mich.
Burden Div., Torrington Mfg. Co., Los Angeles, Calif.
Carolina Blower Co., Inc., Greensboro, N. C.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Denbo Engineering & Sales Co., Inc., Indianapolis, Ind. (molded plastics)
Garden City Fan Co., Chicago, Ill.
General Blower Co., Morton Grove, Ill.
Hastings Air Control, Inc., Omaha, Nebr.
Jaden Mfg. Co., Hastings, Neb.
Jan-Air, Inc., Richmond, Ill.
Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago, Ill.
Mayne Products Co., Dayton, O.
Moore Co., The, Marceline, Mo.
Morrison Products, Inc., Cleveland, O.
New York Blower Co., Chicago, Ill.
Palmer Mfg. Corp., Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Revcor, Carpentersville, Ill.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Torrington Mfg. Co., Torrington, Conn.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.
Viking Air Conditioning Div., National-U. S. Radiator Corp., Cleveland, O.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

WHITE PRINT MACHINES

See Machines, Blue Print and White Print

WINDOW PANELS FOR AIR CONDITIONERS

See Panels, Window, for Air Conditioners

WINDOW VENTILATOR AND FILTER UNITS

See Units, Window Ventilator and Filter

WINDOWS, HEAT INSULATING

Anderson Corp., Bayport, Minn.
Chamberlin Co. of America, Detroit, Mich.
Libbey-Owens-Ford Glass Co., Toledo, O.
Mississippi Glass Co., St. Louis, Mo.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Russell Co., F. C., The, Cleveland, O.

WIRE, ELECTRIC, NUMBERED, FOR CONTROL SYSTEMS

American Hard Rubber Co., New York, N. Y.
Chester Cable Corp., Chester, N. Y.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Essex Wire Corp., Ft. Wayne, Ind.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Midwest Air Conditioning Co., Des Moines.
Midwest Automatic Control Co., Des Moines, Ia.
Phelps Dodge Copper Products Corp., British American Tube Div., New York, N. Y.
United States Rubber Co., New York, N. Y.
Western Lithograph Co., Los Angeles, Calif.

WIRE, INSTRUMENT

American Hard Rubber Co., New York, N. Y.
Chester Cable Corp., Chester, N. Y.
Essex Wire Corp., Ft. Wayne, Ind.
Foxboro Co., Foxboro, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
United States Rubber Co., New York, N. Y.

WIRE, OIL BURNER IGNITION

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Hard Rubber Co., New York, N. Y.
Chester Cable Corp., Chester, N. Y.
Essex Wire Corp., Ft. Wayne, Ind.
Phelps Dodge Copper Products Corp., British American Tube Div., New York, N. Y.
United States Rubber Co., New York, N. Y.

WIRING, COMPLETE ASSEMBLIES, CUSTOM-MADE

American Hard Rubber Co., New York, N. Y.
Chester Cable Corp., Chester, N. Y.
Cornish-Rutland Co., Rutland, Vt.
Essex Wire Corp., Ft. Wayne, Ind.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Kulka Electric Mfg. Co., Mt., Vernon, N. Y.
Packard Electric Div., General Motors Corp., Warren, O.

WRAP, PIPE

Asbestos Asphalt Insulation Co., Chicago, Ill.
Canvas Products Co., St. Louis, Mo.
Johns-Manville, New York, N. Y.
L. O. F. Glass Fibers Co., Toledo, O.
Minnesota Mining & Mfg. Co., St. Paul.
Tapecoat Co., The, Evanston, Ill. (cool tar protective coating in tape form for pipe and fittings, insulated pipe underground and above ground.)

WRENCHES, CHAIN, PIPE

Armstrong Bros. Tool Co., Chicago, Ill.
Blackhawk Mfg. Co., Milwaukee, Wis.
Chicago Specialty Mfg. Co., Chicago, Ill.
Erie Tool Wks., Erie, Pa.
Nye Tool Co., Chicago, Ill.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Talon Tools, Inc., North Arlington, N. J.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.

WRENCHES, PIPE

American Machine Wks., Inc., Racine, Wis.
Armstrong Bros. Tool Co., Chicago, Ill.
Austin Corp., Robert, Boston, Mass.
Billings & Spencer Co., Hartford, Conn.
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Capewell Mfg., Hartford, Conn.
Erie Tool Works, Erie, Pa.
Fairmount Tool & Forging, Cleveland, O.
Frontier Bronze Corp., Niagara Falls, N. Y.
International Forge Co., Chicago, Ill. (aluminum)
Lowell Wrench Co., Worcester, Mass.
Lurie & Lurie, Chicago, Ill.
Nobel & Brienholt, Salt Lake City, Utah
Nye Tool Co., Chicago, Ill.
Peck, Stow & Wilcox Co., Southington, Conn.
Proto Tool Co., Los Angeles, Calif.
Ridge Tool Co., Elyria, O.
Roddick Tool Co., Anaheim, Calif.
Sac Tool Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Talon Tools, Inc., North Arlington, N. J.
Tedd Company, The, Rockford, Ill.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of Aetna Industrial Corp., Boston, Mass.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Walworth Co., New York, N. Y.

WRENCHES, PIPE, REPLACEABLE JAW

Blackhawk Mfg. Co., Milwaukee, Wis.
Erie Tool Wks., Erie, Pa.
International Forge Co., Chicago, Ill.
Lurie & Lurie, Chicago, Ill.
Nye Tool Co., Chicago, Ill.
Proto Tool Co., Los Angeles, Calif.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Walworth Co., New York, N. Y.

WRENCHES, RATCHET

Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Duro Metal Products Co., Chicago, Ill.
Greene, Tweed & Co., North Wales, Pa.
J O Mfg. Co., South Gate, Calif.
Lowell Wrench Co., Worcester, Mass.
Lurie & Lurie, Chicago, Ill.
Proto Tool Co., Los Angeles, Calif.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
William & Co., J. H., Buffalo, N. Y.
X-4 Corp., West Concord, Mass.

WRENCHES, TORQUE INDICATING

Ammco Tools, Inc., North Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Duro Metal Products Co., Chicago, Ill.
J O Mfg. Co., South Gate, Calif.
Kent-Moore Organization, Inc., Detroit, Mich.
Proto Tool Co., Los Angeles, Calif.
Richmont, Inc., Monrovia, Calif.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp, Kenosha, Wis.
Sturtevant Co., P. A., Addison, Ill.
Williams & Co., J. H., Buffalo, N. Y.
Wilson Co., K. R., Arcade, N. Y.

X-RAY MACHINES AND FILM

See Machines and Film, X-Ray

ZONE CONTROLS

See Systems, Heating, Zone Control

DIRECTORY SECTION
HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRY AND LARGE BUILDINGS

PART 3—ALL TRADE NAMES

ARR 300#—Unions. Jefferson Union Co., New York, N. Y.
A-B—Motor controllers. Allen-Bradley Co., Milwaukee, Wis.
ABC—Dehumidifiers, humidifiers, dust collectors, unit coolers. American Blower Corp., Detroit, Mich.
A-C—Water treatment. Elgin Softener Corp., Elgin, Ill.
ACB—Coatings. Tropical Paint & Oil Co., Cleveland, O.
A/C Range—Filters. American Air Filter Co., Inc., Louisville, Ky.
A & R—Dehumidifiers. Air & Refrigeration Corp., New York, N. Y.
AISI Automatic Smoke Sampler—Testers, smoke. Research Appliance Co., Pittsburgh, Pa.
ARRC—Couplings, fittings, flanges, unions. Union Metal Wks., Chelsea, Mass.
ASBO—Ventilators, louvers and shutters. American Steel Band Co., Pittsburgh, Pa.
ASME—Regulators. Bell & Gossett Co. Morton Grove, Ill.
AUS Mun—Air conditioning units. Austin Engrg. & Mfg. Co., Inc., Ysleta, Tex.
Abco—Water heaters. Riverside Boiler & Engrg. Co., Inc., Ft. Worth, Tex.
Abrasoweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Abso-Lute—Cement and compounds. Key Co., East St. Louis, Ill.
Absolute—Air filters. Cambridge Filter Corp., Syracuse, N. Y.
Accordion—Insulation. Infra Insulation, Inc., New York, N. Y.
Ace—Dampers. Marsto Machine Co., West Quincy, Mass.
Ace—Fittings, pipe, protective coatings, pumps, tanks, valve. American Hard Rubber Co., New York, N. Y.
Ace—Welders. Peer, Inc., Benton Harbor, Mich.
Ace-Flex—Plastic tubing. American Hard Rubber Co., New York, N. Y.
Ace-Ite—Plastic pipe. American Hard Rubber Co., New York, N. Y.
Ace-Saran—Plastic tubing. American Hard Rubber Co., New York, N. Y.
Acid Causticbond Tank Lining System—Linings. Wilbur & Williams Co., Brighton, Mass.
Acipco—Steel tubing. American Cast Iron Pipe Co., Birmingham, Ala.
Ackerock—Tank linings. Acker Organization, Inc., W. M., Meridian, Miss.
Acolite—Enamels and lacquers. Acorn Paint and Chemical Co., Cleveland, O.
Acousteel—Insulation. Celotex Corp., The, Chicago, Ill.
Acousti-Celotex—Insulation. Celotex Corp., The, Chicago, Ill.
Acoustilite—Insulation. Insulite Co., Minneapolis, Minn.
Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Acro—Gages, regulators. Air Conversion Research Corp., Chicago, Ill.
Acrowrap—Insulation. Owens-Corning Fiberglas Corp., Toledo, O.
Actex—Heat exchangers. Wabash Corp., Chicago, Ill.
Adacast—Refractories. Botfield Refractories Co., Philadelphia, Pa.
Adamant—Furnace cement. Botfield Refractories Co., Philadelphia, Pa.
Adapatch—Refractories. Botfield Refractories Co., Philadelphia, Pa.
Adapto—Furnaces. Mammoth Furnace Co., St. Paul, Minn.
Adastic—Insulating cement. Botfield Refractories Co., Philadelphia, Pa.
Adjusto—Racks. Haertel Co., Walter, Minneapolis, Minn.
Adjust-O-Feeder—Feeders, pumps, water treatment. Proportioneers, Inc., Div. of B-I-F- Industries, Inc. Providence, R. I.
Adjustor—Heating systems. The Kehm Corp., Chicago, Ill.
Adsco—Coils, regulators, exchangers, heaters, joints, meters, pipe hangers and supports, pipe protectors, separators, sight glasses, strainers, American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Adsco Dual—Traps. American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Adsco Rotary—Condensation meters. American District Steam Div. of ADSCO Industries, Buffalo, N. Y.
Aemco—Relays, switches. Automatic Electric Mfg. Co., Mankato, Minn.
Aeracool—Blades, fans, louvers and shutters. Myers Electric Co., Inc., Pittsburgh, Pa.
Aerisweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Aero—Roof ventilators. Jordan & Co., Paul R., Indianapolis, Ind.
Aero—Aftercoolers, heat exchangers. Niagara Blower Co., New York, N. Y.
Aero—Radiation. National-U. S. Radiator Corp., The, Johnstown, Pa.
Aerodyne—Fans, ventilators. Jeffrey Mfg. Co., Columbus, O.
Aerodyne—Collectors. Green Fuel Economizer Co., Beacon, N. Y.
Aerofuse—Air diffusers. Tuttle & Bailey, Inc., New Britain, Conn.
Aeromaster—Propeller fans, blades. Koppers Company, Inc., Baltimore, Md.
Aeromatic Exhauster—Ventilators. Octagon Ventilator Co., Chicago, Ill.
Aeropass—Condensers. Niagara Blower Co., New York, N. Y.
Aeropel—Ventilators. American Blower Corp., Detroit, Mich.
Aeroplane—Roof ventilators. Jordan & Co., Paul R., Indianapolis, Ind.
Aeroplex—Fans. Bayley Blower Co., Milwaukee, Wis.
Aeropull—Roof ventilators. Jordan & Co., Paul R., Indianapolis, Ind.
Aero Seal—Packing. Chicago Belting Co., Chicago, Ill.
Aerosolve—Air filters. Cambridge Filter Corp., Syracuse, N. Y.
Aerospot—Fans. South Bend Air Products, Inc., South Bend, Ind.
Aerovane—Anemometers. Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Aerovane—Grilles, registers. Tuttle & Bailey, Inc., New Britain, Conn.
Aertite—Boiler & tank insulation, compounds. Johns-Manville, New York, N. Y.
Afco—Heaters. American Furnace Co., St. Louis, Mo.
Affco—Louvers and shutters. American Foundry & Furnace Co., Bloomington, Ill.
Agastat—Electrical relays. A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N.J.
Agaswitch—Time switches. A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N.J.
Agilene—Fittings, fans, sheets, ducts and duct fittings, pipe, tubing, welders, valves. American Agile Corp., Bedford, O.
Agilide—Ducts and duct fittings, fans, sheets, pipe, welders, valves. American Agile Corp., Bedford, O.
Agitair—Air diffusers, filters, heaters, meters, ventilators. Air Devices, Inc., New York.
Airacoustic—Insulation. Johns-Manville, New York, N. Y.
Air-aid—Compounds. Lord & Clark Co., Inc., Boston, Mass.
Air Cell—Asbestos insulation. Keasbey & Mattison Co., Ambler, Pa.
Aircell Board—Insulation, Sheets. Norristown Magnesia & Asbestos Co., Norristown, Pa.
Airco—Arc welders, welding rod, solder, pipe cutting machines, torches. Air Reduction Sales Co., New York, N. Y.
Air Control—Fans, heaters, unit air conditioners. Hastings Air Control; Inc., Omaha, Nebr.
Aircon—Condensers. McQuay, Inc., Minneapolis, Minn.
Air-Con—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Aircoustat—Duct insulation. Industrial Sound Control, Inc., Hartford, Conn.
Airditioner—Air conditioning units. Modine Mfg. Co., Racine, Wis.
Airefiner—Water treatment. Oakite Products, Inc., New York, N. Y.
Aire-Rectifier—Coolers. Lintern Corp., Painesville, O.
Airette—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.
Airex—Air washers, fans, unit air conditioners, ventilators. Mountain States Equipment Co., Denver, Colo.
Airflex—Couplings. Falk Corp., Milwaukee.
Air-flo—Louvers and shutters. Air Conditioning Products Co., Detroit, Mich.
Airfoil—Fans, fan blades, ventilators. Aerovent Fan Co., Inc., Piqua, O.
Airfoil—Dampers, diffusers, grilles, registers. Titus Mfg. Corp., Waterloo, Ia.
Airfoil—Registers, scoops, grilles, dampers, diffusers. Titus Mfg. Corp., Waterloo, Ia.
Airfuge—Separators. Swartwout Co., The, Cleveland, O.
Air Guide—Vanes. Titus Mfg. Corp. Waterloo, Ia.
Air Guide — Radiation. Rempe Co., Chicago.
Airid—Valves. Quality Specialty Co., Inc., Camden, N. J.
Airistrocrat—Fan blades. Torrington Mfg. Co., Torrington, Conn.
Airjector—Ventilators: Swartwout Co., Cleveland, O.
Airlift—Ventilators. Swartwout Co., Cleve-
Air Line—Motors. Brock-Brockmeyer Co., Inc., Dayton, O.
Airline-Norge Heat—Heaters, air conditioning units. Ingersoll Conditioned Air Div., Borg-Warner Corp., Kalamazoo, Mich.
Airliner—Fan blades, and fans. Burden Co., Alan E., Los Angeles, Calif.
Airlouver—Louvers and shutters. Swartwout Co., Cleveland, O.
Airmaster—Dehumidifiers. Haertel Co., Walter, Minneapolis, Minn.
Airmat Arrester—Dust collectors. American Air Filter Co., Inc., Louisville, Ky.
Airmat Drifilter—Filters. Airgard Mfg. Co. Chicago, Ill.
Air-Max—Dampers, diffusers, fans, unit heaters, ventilators. Gallaher Co., The, Omaha, Neb. & Owatonna, Minn.
Air Meter—Air velocity meters. Hastings Instrument Co., Inc., Warwick, Va.
Air Mist—Chillers. Coleman Co., Inc., The, Wichita, Kans.
Air Motor Valves—Valves. General Controls Co., Glendale, Calif.
Airmover—Ventilators. Swartwout Co., Cleveland, O.
Airocool—Burners. National Airoil Burner Co., Inc., Philadelphia, Pa.
Airo-Flex—Registers. Auer Register Co., Cleveland, O
Airoil—Oil burners. National Airoil Burner Co., Inc., Philadelphia, Pa.
Air-O-Line—Pumps, valves. Beckett & Co., Inc., Thomas, Dallas, Tex.
Air-O-Matic—Air conditioning units. Williams Div., Eureka Williams Corp., Div. of Henney Motor Co., Inc., Bloomington, Ill.
Air-O-Rator—Units, window ventilator and filter. Goodwill Mfg. Co., Chicago, Ill.
Airotor—Blower wheels. Torrington Mfg. Co., Torrington, Conn.
Airout—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.
Air-O-Vane—Diffusers. Krueger Air Conditioning Co., Tucson, Ariz.
Airovent—Gas Burners. National Airoil Burner Co., Inc., Philadelphia, Pa.
Airpak—Filters. Conoflow Corp., Philadelphia.
Airphlo—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Air Prover—Regulators. A-P Controls Corp., Milwaukee, Wis.
Air Pure—Air filters. Flanders Mill, Inc., Riverhead, Long Island, N. Y.
Air Rad—Radiation. Penn Boiler & Burner Corp., Lancaster, Pa.
Airsan—Filters. Air Filter Corp., Milwaukee.
Air-Scoop—Eliminators. Taco Heaters, Inc. Cranston, R. I.
Airstat — Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Airswitch—Thermostats, regulators. Minneapolis-Honeywell Regulator Co., Minneapolis.
Air-Trim Baseboard—Diffusers. Vulcan Radiator Co., Hartford, Conn.
Airtrol—Air eliminators. Bell & Gossett Co., Morton Grove, Ill.
Airtron—Ducts and duct fittings, hose, insulation. Arrowhead Rubber Co., Long Beach, Calif.
Air-Tumbler—Dust collectors. Dust Suppression & Engineering Co., Lake Orion, Mich.
Airturn—Duct turning vanes. Barber-Colman Co., Rockford, Ill.
Airvalve—Ventilators. Swartwout Co., Cleveland, O.
Air-Van—Ventilators, exhausters, fans. Gal-

iaher Co., The, Owatonna, Minn. & Omaha, Neb.
Air-Wave—Fans. Trade-Wind Motorfans, Inc., Los Angeles, Calif.
Air-X-it—Roof ventilators. Octagon Ventilator Co., Chicago, Ill
Airxpel—Traps. Wright-Austin Co., Detroit.
Airxpeler—Roof ventilators, dampers, fittings, hose, exhausters, centrifugal fans, louvers and shutters, vent flue caps. Ammerman Co., G. L., Minneapolis, Minn.
Ajax—Gaskets, United States Gasket Co., Camden, N. J.
Akon—Water treatment. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Aktiv—Cleaning compounds. Turco Products, Inc., Los Angeles, Calif.
Alaskan—Fans, air conditioning units. National Engrg & Mfg. Co., Sedalia, Mo.
Alathon—Plastics, powders and resins. du Pont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del.
Alcalex—Water softeners. Research Products Corp., Madison, Wis.
Alcoa—Angles, compounds, rods, dehydrators, electrodes, exchangers, pipe, sheets, tanks, tubing. Aluminum Co. of America, Pittsburgh, Pa.
Alcoplate—Pipe. Alco Products, Inc., Schenectady, N. Y.
Alcotwin—Exchangers. Alco Products, Inc., Schenectady, N. Y.
Alcuplate—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Alen—Units, washers. Comfort Products Corp., Dallas, Tex.
Alfol—Insulation. Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.
Algaecide—Water treatment Anderson Chemical Co., Inc., Macon, Ga.
Algaecide—Water treatment. Western Chemical Co., Kansas City, Mo.
Aliron—Sheets; clad. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Alkasteem—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.
Alkyd—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.
All Blow—Fans. Trade Wind Motorfans, Inc., Rivera, Calif.
All-Chem—Rotary pumps. Eco Engineering Co., Newark, N. J.
Allen—Benders. Steel City Electric Co., Pittsburgh, Pa.
Allencote—Refractories and refractory cement. Allen Co., Robert G., Mechanicsville, N. Y.
Allenite—Soot destroyers. Allen Co., Robert G., Mechanicsville, N. Y.
All-In-One—Regulators. Bell & Gossett Co., Morton Grove, Ill.
All-Metl—Vibration isolating bases and pads. Barry Corp., Watertown, Mass.
All-Motor—Gear-motors. Falk Corp., Milwaukee, Wis.
Allmul—Refractories and refractory cement. Babcock & Wilcox Co., New York, N. Y.
All Purpose—Grilles. Louvra Mfg. & Sales Co., Union, N. J.
Allspeed Selector—Mechanical changers. Worthington Corp., Harrison, N. J.
Alltemp—Insulation. Philip Carey Mfg. Co., Cincinnati, O.
All-Tite—Vanes. Elgen Mfg. Corp., Long Island City, N. Y.
Alnifer—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Alnor—Anemometers, indicator controllers, thermometers. Illinois Testing Laboratories, Inc., Chicago, Ill.
Alodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Aloyco—Pipe, tubing, valves. Alloy Steel Products Co., Linden, N. J.
Alpine—Air conditioning units. International Metal Products Co., Phoenix, Ariz.
Allprene—Gaskets. Chicago Gasket Co., Chicago, Ill.
Alsiplate—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Alternarc—Arc welders. Electric Arc, Inc., Newark, N. J.
Alumattic—Louvers and shutters. Phil Rich Fan Mfg. Co., Houston, Tex.
Alumaweld—Solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Alumilux—Heaters. Clayton & Lambert Mfg. Co., Louisville, Ky.
Aluminweld—Electrodes. Lincoln Electric Co., Cleveland, O.
A-Lum-O—Filters. Bard Mfg. Co., Bryan, O.
A-Lum-O-Aire—Filters. Carey Electronic Engineering Co., Metal Wool Div., Springfield, O.
Alundum—Cement, furnace, grinders and grinding wheels, refractories and refractory cement. Norton Co., Worcester, Mass.
AluTin—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.
Always Reliable—Benders, cutters, torches, wrenches. Bernz Co., Otto, Rochester, N. Y.
Amblerex—Insulating cement. Keasbey & Mattison Co., Ambler, Pa.
Amco—Protective coatings. American Solder & Flux Co., Philadelphia, Pa.
Amco—Humidifiers. Grinnell Co., Inc., Providence, R. I.
Amco—Control Systems, humidifiers, hygrometers indicators, meters, nozzles, tanks, air conditioning units, psychrometers, valves. American Moistening Co., Providence, R. I.
Amcoil—Cooling units. American Coils Co., Newark, N. J.
Amer-Clone—Collectors. American Air Filter Co., Inc., Louisville, Ky.
Amer-glas—Air filters. Bowman Co., D. F., New Albany, Ind.
Amer-glas—Unit filters. American Air Filter Co., Inc., Louisville, Ky.
American—Absorbers, metal hose, tubing. American Metal Hose Div., American Brass Co., The, Waterbury, Conn.
American—Couplings. American Flexible Coupling Co., Erie, Pa.
American—Furnaces, heaters. American Foundry & Furnace Co., Bloomington, Ill.
American—Recorders, hygrometers, manometers, regulators, recorder-controllers, thermometers, transmitters, wells. Manning, Maxwell & Moore, Inc., Stratford, Conn.
American—Speed reducers. American Pulley Co., Philadelphia, Pa.
American—Pumps, softeners, water filters, water treatment. American Well Works, Aurora, Ill.
American—Pipe benders. American Pipe Bending Machine Co., Inc., Poultney, Vt.
American—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
American—Meters. Buffalo Meter Co., Buffalo, N. Y.
American Empire—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh.
American Exbrook—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh.
American Hammered—Rings. Koppers Company, Inc., Metal Products Div., Baltimore.
American H/V—Unit Filters. American Air Filter Co., Inc., Louisville, Ky.
American-Microsen — Transmitters. Manning, Maxwell & Moore, Inc., Stratford, Conn.
American Redflash—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh.
American Standard—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh.
American Superfin—Heaters. American Foundry & Furnace Co., Bloomington, Ill.
American Water Tube—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Amerigear—Couplings. American Flexible Coupling Co., Erie, Pa.
Ameritherm—Heaters, air conditioning units. American Thermal Industries, Inc., Detroit.
Amerjet—Collectors. American Air Filter Co., Inc., Louisville, Ky.
Amerplate—Tank linings. Amercoat Corp., South Gate, Calif.
Ames—Pumps. Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Amesteam—Boilers. Ames Iron Works, Inc., Oswego, N. Y.
Aminco—Calorimeters, gage testers, indicator controllers, indicators, pumps, recorders, regulators, relays, viscosimeters. American Instrument Co., Inc., Silver Spring, Md.
Ammonoduct—Pipe. Bethlehem Steel Co., Bethlehem, Pa.
Ampcoflex—Pipe fittings, fume disposal hoods, plastic valves. Atlas Mineral Products Co., Mertztown, Pa.
Am-Pe-Co—Centrifugal fans. American Machine Products Co., Marshalltown, Ia.
Amphesive—Adhesives. Atlas Mineral Products Co., Mertztown, Pa.
Amtico—Heaters, air conditioning units. American Thermal Industries, Inc., Detroit.
Anaconda—Fitting, pipe, welding rod, sheets, solder, tubing, valves. American Brass Co., Waterbury, Conn.
Anco—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.
Anco Condenser Cleaner—Compounds, scale removal. Anderson Chemical Co., Inc., Macon, Ga.
Andrite—Dehydrators. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Anemotherm—Direct reading meters, Anemostat Corp. of America, New York, N. Y.
Ankorite—Packing. Anchor Packing Co., Philadelphia, Pa.
Anti-Capillary—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Anti-Spatter—Welding compounds. Wolfe-Kote Co., Inc., Sheboygan, Wis.
Apco—Turbine type pumps, systems. Aurora Pump Co., Aurora, Ill.
Apeco—Blueprint machines. American Photocopy Equipment Co., Chicago, Ill.
Apex—Analyzers, recorders, indicators. Uehling Instrument Co., Paterson, N. J.
Apexior—Coatings. Dampney Co. of America, Boston, Mass.
Aprilaire—Humidifiers. Research Products Corp., Madison, Wis.
Apsco—Switches. April Showers Co., Inc., Washington, D. C.
Aptco—Wrenches. Nobel & Brienholt, Salt Lake City, Utah.
Apthorp—Nozzles. Boston Machine Works, Inc., Lynn, Mass.
Aqua-Clear—Water treatment. Sudbury Laboratory, South Sudbury, Mass.
Aquacooler—Towers, cooling. The Marley Co., Kansas City, Mo.
AquaHeater—Heaters. Lewis & Co., Joseph E., Baltimore, Md.
Aqualator—Circulators. Triplex Heating Specialty Co., Inc., Peru, Ind.
Aqua-Line—Radiation. York-Shipley, Inc., York, Pa.
Aquamizer—Condensers. Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Aqua-Saver—Cooling towers. Peerless Products Div., United Cooling Towers, Inc., N. Little Rock, Ark.
Aquastat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Aqua-Tite—Seals. Schwitzer-Cummins Co., Indianapolis, Ind.
Aquatone—Treatment, steam and water. Ampion Corp., Long Island City, N. Y.
Aquatower—Cooling towers. Marley Co., The, Kansas City, Mo.
Arbest—Flanges, hangers, humidifiers, nipples, plates, valves. G & H Mfg. Co., Philadelphia, Pa.
Arcaloy—Electrodes. Alloy Rods Co., York, Pa.
Arc-Eng—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Arco—Hangers, radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Arcoliner—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Arco Sil—Hose, ducts and duct fittings. Arrowhead Rubber Co., Long Beach, Calif.
Arctic Circle—Air conditioning units. International Metal Products Co., Phoenix, Ariz.
Arex-Austor—Roof ventilators. Arex Co., Chicago, Ill.
Arid Air—Dehumidifiers. Tamms Industries, Inc., Chicago, Ill.
Arin—Louvers and shutters. Arex Co., Chicago, Ill.
Armaloy—Wrenches. Armstrong Bros. Tool Co., Chicago, Ill.
Ar-Met—Meters. Brooks Rotameter Co., Lansdale, Pa.
Armourflow—Flexible hose. Newage International, Inc., Bala Cynwyd, Pa.
Armourvin—Flexible hose. Newage International, Inc., Bala Cynwyd, Pa.
Armstrong-Bridgeport—Benders, chasers, cutters, pipe cutting oil, reamers, stands, stocks and dies, taps, tools, vises, and wrenches. Capewell Mfg. Co., Hartford, Conn.
Aroclor—Heat transfer oil. Monsanto Chemical Co., St. Louis, Mo.
Arrow-Line—Heaters. Bastian-Morley Co., Inc., La Porte, Ind.
Arrowtrol—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Art—Direct radiation. The National-U. S. Radiator Corp., Johnstown, Pa.
Artcraft—Air heaters. Chicago Steel Furnace Co., Chicago, Ill.
Artic—Refrigerant. E. I. du Pont de Nemours & Co., Wilmington, Del.
Asbestocel—Boiler, tank & pipe insulation. Johns-Manville, New York, N. Y.
Asbestocite—Boiler & tank insulation. Johns-Manville, New York, N. Y.
Asbestolux—Insulation. North American Asbestos Corp., Chicago, Ill.
Asco—Valves, relays, switches, panel and control boards. Automatic Switch Co., Orange, N. J.
Ashcroft—Gages, cocks, recorders, switches, valves, testers, transmitters. Manning, Maxwell & Moore, Inc., Stratford, Conn.
Aspir-Jet—Nozzles. Thermal Agency, Houston, Tex.
At-a-Glance—Gages. Krueger Sentry Gauge Co., Green Bay, Wis.
Athol—Fittings, unions. Leavitt Machine Co., Orange, Mass.
Atlas—Diffusers, grilles, registers. J. B. Smith Co., Philadelphia, Pa.
Atlas—Paint. Foster Co., Benjamin, Philadelphia, Pa.
Atlas—Fans, furnaces, heaters. International Sales Co., San Francisco, Calif.
Atmos-Therm—Condensers. Rempe Co., Chicago, Ill.
Atom-Arc—Electrodes. Alloy Rods Co., York, Pa.
Atomick—Humidifiers, nozzles. Maid-O'-Mist, Inc., Chicago, Ill.
Atomist—Humidifiers. American Foundry & Furnace Co., Bloomington, Ill.
AutofyrStop—Systems. Merchant & Evans Co., Philadelphia, Pa.
Autographs—Nameplate parts. Metalcraft Inc., Mason City, Ia.
Auto-Klean—Filters, strainers. Cuno Engineering Corp., Meriden, Conn.
Autolec—Generators. Orr & Sembower, Inc., Reading, Pa.
Autolite—Motors, wire, recorders, thermometers. Electric Autolite Co., Instrument & Gauge Div., Toledo, O.
Autolube—Bearings. International Powder Metallurgy, Inc., Ridgway, Pa.

Automaze—Filters. Air-Maze Corp., Cleveland, O.
Auto-Vent—Eliminators, humidifiers, valves. Maid-O'-Mist, Inc., Chicago, Ill.
Autronic—Recorders, indicator-controllers, meters, recorder-controllers. Swartwout Co., Cleveland, Ohio.
Aveco—Valves. Associated Valve & Engineering Co., Chicago, Ill.
Axiflo—Fans. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Axivane—Blowers. Joy Mfg. Co., Pittsburgh

B.A.C.—Condensers, oil coolers, cooling towers. Baltimore Aircoil Co., Inc., Baltimore, Md.
BAC—Air conditioning units. Brunner Mfg. Co., Utica, N. Y.
B. B.—Blast gates. Berger Bros. Co., Philadelphia, Pa.
B & B—Heating and air conditioning equipment. Bishop & Babcock Mfg. Co., Cleveland, O.
B & C—Plates, valves, unions. Beaton & Corbin Mfg. Co., Southington, Conn.
BCA—Bearings. Bearings Co. of America, Lancaster, Pa.
B. & G.—Air eliminators, circulators, coolers, condensers, fittings, heat exchangers, heaters, heating systems, temperature regulators, tanks, valves. Bell & Gossett Co., Morton Grove, Ill.
B-H—Insulation. Baldwin-Hill Co., Trenton, N. J.
B-H—Insulating cement, pipe insulation. Baldwin-Hill Co., Trenton, N. J.
B-H No. 1 Powerhouse—Insulation. Baldwin-Hill Co., Trenton, N. J.
B & J—Orifices, pumps, strainers, systems, traps, valves. Barnes & Jones, Inc., Boston.
B & K—Pipe cutting and threading machines. Bignall & Keeler, Div., John Ramming Machine Co., St. Louis, Mo.
B-Line—Electric motors. Brown-Brockmeyer Co., Inc., Dayton, O.
B.O.—Cocks, joints, valves. Bordo Co., Inc., L. J., Glenside, Pa.
B & P Enamel—Enamels and lacquers. Tropical Paint Co., Cleveland, O.
BU—Couplings. Dahl, G. W., Bristol, R. I.
B & W—Boilers, burners, desuperheaters, fuel economizers, refractories, stokers, superheaters. Babcock & Wilcox Co., New York, N. Y.
B & W—Pipe fittings, flanges, tubes and tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
B & W—Tubing. Babcock & Wilcox Co., The, Tubular Products Div., Alliance, O.
Bacite—Insulation. Bird-Archer Co., Philadelphia, Pa.
Baco—Soot destroyer, pumps. Bird-Archer Co., Philadelphia, Pa.
Badger—Time switches. Reliance Automatic Lighting Co., Racine, Wis.
Baflex—Enamels and lacquers, protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.
Balance-trol—Heating systems. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Ball-Lok—Drives. V-Belt Clutch Co., Los Angeles, Calif.
Ball-Rite—Drills. Oster Mfg. Co., John, Milwaukee, Wis.
Balsam-Wool—Insulation. Wood Conversion Co., St. Paul, Minn.
Banroc—Pipe insulation. Johns-Manville, New York, N. Y.
Bantam—Valves. Dahl, G. W., Bristol, R. I.
Barcol—Motors, operators. Barber-Colman Co., Rockford, Ill.
Barnes—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.
Barnes—Cutters. Erie Tool Works, Erie, Pa.
Bar-O-X—Protective coatings. Truscon Laboratories, Detroit, Mich.
Barreled Sunlight—Enamels. U.S. Gutta Percha Paint Co., Providence, R. I.
Barton-American—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
Base Ray—Baseboard radiation. Burnham Corp., Irvington, N. Y.
Basic magnesite—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Basifrit—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Baso—Valves. Milwaukee Gas Specialty Co., Milwaukee, Wis.
Bazooka—Torches. Deutsch Co., The, Los Angeles, Calif.
Beacor—Valves. Beaton & Corbin Mfg. Co., Southington, Conn.
Beco-Cell—Corrosion treatment, scale removal. Brown Electro Co., Oklahoma City, Okla.
Bell-Pack—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Beloit—Machines, punches, power shears Hendley & Whittemore Co., Beloit, Wis.
Berkshire—Hangers and supports. Armart Mfg. Co., Pittsfield, Mass.
Bermico—Fiber glass. Brown Co., Boston, Mass.
Bestfelt "Lamino Sponge"—Insulation. Keasley & Mattison Co., Ambler, Pa.
Bestoil—Pipe oil. Oster Mfg. Co., Cleveland, O.
Beth-Co-Weld—Pipe. Bethlehem Steel Co., Bethlehem, Pa.
Beth-Cu-Loy—Sheets. Bethlehem Steel Co., Bethlehem, Pa.
Bi-Air—Burners. John Zink Co., Tulsa.
Bifurcator—Fans. DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Bildrite—Insulation. Insulite Co., Minneapolis, Minn.
Biltin—Heaters. Taco Heaters, Inc., Cranston, R. I.
Bi-Mix—Burners. John Zink Co., Tulsa, Okla.
Binoc—Thermometers. Taylor Instrument Companies, Rochester, N. Y.
Bison—Boilers. Farrar & Trefts, Div. of ADSCO Industries, Buffalo, N. Y.
Bitumastic—Protective coatings. Koppers Co., Inc., Pittsburgh, Pa.
Bituminous—Bases and pads. Celotex Corp., The, Chicago, Ill.
Bituminous—Coatings. Robertson Co., H. H., Pittsburgh, Pa.
Bituplastic—Coatings. Koppers Co., Inc., Pittsburgh, Pa.
Black Baking Japans—Enamels and lacquers. Hilo Varnish Co., Brooklyn, N. Y.
Black-Buty—Plastic pipe and tubing. Anesite Co., Chicago, Ill.
Black-Poly—Plastic pipe and tubing. Anesite Co., Chicago, Ill.
Blazecrete—Refractories. Johns-Manville, New York, N. Y.
Blend-Air—Ducts and duct fittings, heaters, air conditioning units. Coleman Co., Inc., The, Wichita, Kans.
Blender—Diffusers. Coleman Co., Inc., The, Wichita, Kans.
Bloapco—Dust collectors. Blower Application Co., Milwaukee, Wis.
Bluebonnet—Air conditioning units. Forston Co., Houston, Texas
Blu-Cold—Compressors. Lehigh Mfg. Co., Div. of Lehigh Inc., Lancaster, Pa.
Blu-Flame—Burners, heaters. Vacuum Gas Burner, Olean, N. Y.
Blue Circle—Heating boilers. Dunkirk Radiator Corp., Dunkirk, N. Y.
Blue Dot—Benders. Imperial Brass Mfg. Co., Chicago, Ill.
Blueknight—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Blue-Point—Cutters, Tools, wrenches. Snap-on Tools Corp., Kenosha, Wis.
Blue Ribbon—Headers and nipples. Chicago Nipple Mfg. Co., Cicero, Ill.
Blue Streak—Dehydrators. Wabash Corp., Chicago, Ill.
Boardman—Pump governors. Locke Regulator Co., Salem, Mass.
Bob—Float valves. Robert Mfg. Co., Los Angeles, Calif.
Boilergard—Low water cut-offs. Maid-O'-Mist, Inc., Chicago, Ill.
Boiler-Lox—Compounds. Radiator Specialty Co., Charlotte, N. C.
Boiler Solder Seal—Compounds. Radiator Specialty Co., Charlotte, N. Carolina.
Boltaron 6200—Pipe fittings, plastic pipe, plastic sheets, plastic tubing, valves. H. N. Hartwell & Son, Inc., Boston, Mass.
Bolt-O-Seal—Bolts. Wolfe Co., Inc., Franklin C., The, Culver City, Calif.
Bondwich—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Booster—Units, Fuel Oil. Cleaver Brooks Co., Milwaukee, Wis.
Borgana—Compounds, treatments. Strong Carlisle & Hammond Co., Cleveland, O.
Bosco—Clay pipe. Bowerston Shale Co., The, Bowerston, O.
Brad-Ray—Radiant heating coils and panels. Carlon Products Corp., Cleveland, O.
Branford—Oil burners, unions. Malleable Iron Fittings Co., Branford, Conn.
Brassweld—Compounds. Sight Feed Generator Co., West Alexandria, O.
Braxon—Compounds, scale removal, water treatment. Anderson Chemical Co., Inc., Macon, Ga.
Brazaloy—Solder. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Brazo—Solder. Linde Air Products Co., The, Unit of Union Carbide & Carbon Corp., New York, N. Y.
Breeze Master—Fans. Acme Equipment Co., Muskogee, Okla.
Breezo—Fans. Buffalo Forge Co., Buffalo, N. Y.
Breezy-Air—Air conditioning units. Barwick Mfg. Corp., Wichita, Kan.
Brillant Fire—Heaters. Ohio Foundry & Mfg. Co., Steubenville, O.
Bronco—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Bronze-Arc C—Electrodes. Alloy Rods Co., York, Pa.
Bronze-Arc Mn—Electrodes. Alloy Rods Co., York, Pa.
Bronze-Chem—Rotary pumps. Eco Engineering Co., Newark, N. J.
Bronze-Chrom—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.
Bronze-Flame—Rod. Alloy Rods Co., York, Pa.
Bronzende—Electrodes. Arcos Corp., Philadelphia, Pa.
Bronzeweld—Compounds. Sight Feed Generator Co., West Alexandria, O.
Brooklyn—Adhesive tape. Johns-Manville, New York, N. Y.
Brown-Heet—Heaters. Brown Products Co., Forest Hills, N. Y.
Brule—Incinerators. Goder Incinerator Corp., Chicago, Ill.
BTUnit—Unit heaters. Industrial Mfg. & Engineering Co., Chicago, Ill.
Budget—Water heaters. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Buildrite—Insulation. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis.
Bulator—Grilles. Hendrick Mfg. Co., Carbondale, Pa.
Bulk-Flo—Conveyors. Link-Belt Co., Chicago, Ill.
Bulldog—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Bulldog—Bolts, drills. Polis Mfg. Co., J. D., Chicago, Ill.
Bulldog—Shears and snips. Wiss & Sons Co., J., Newark, N. J.
Bull Dog—Stocks and dies. Oster Mfg. Co., Cleveland, O.
Bull Dog—Pulleys and sheaves. Boston Woven Hose & Rubber Co., Cambridge, Mass.
Bull Dog—Valves. The Carpenter Valve Corp., Cleveland, O.
Bull's Eye—Glasses. Fischer & Porter Co., Hatboro, Pa.
Bullet—Filters. Sealed Unit Parts Co., Inc., Bronx, N. Y.
Bundyweld—Tubes and tubing. Bundy Tubing Co., Detroit, Mich.
Bunker Hill—Fittings, pipe, sheets, solder Northwest Lead Co., Seattle, Wash.
Burdco—Blades, fans. Burden Co., Alan E., Los Angeles, Calif.
Burks—Pumps. Decatur Pump Co., Decatur, Ill.
Burnham—Compressors, condensers, pumps. Union Steam Pump Co., Battle Creek, Mich.

C-E—Boilers, stokers, fuel economizers. Combustion Engineering, Inc., New York.
CE-Heatmaster—Water heaters. Combustion Engineering, Inc., New York, N. Y.
CE-Raymond—Air separators. Combustion Engineering, Inc., New York, N. Y.
C-H—Alarms, controllers and starters, heaters, relays, regulators, switches, valves. Cutler-Hammer, Inc., Milwaukee, Wis.
C & L—Heaters, torches. Clayton & Lambert Mfg. Co., Louisville, Ky.
CM—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
CMC Aluminum—Enamels and lacquers Acorn Paint & Chemical Co., Cleveland, O.
C & M—Hangers or brackets, inserts. Carty & Moore Engineering Co., Detroit, Mich.
COM—Blowers. Wing Mfg. Co., L. J., New York, N. Y.
C & R—Regulators. Automatic Control Co., St. Paul, Minn.
CSP—Transformers. Westinghouse Electric Corp., Pittsburgh, Pa.
CTF—Pipe fittings. Clyde Tube Forgings of America, Inc., Portland, Ore.
CW—Pipe. Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
CWF—Chillers. Taco Heaters, Inc., Cranston, R. I.
Cablestat—Cable. Wiegand Co., Edwin L., Pittsburgh, Pa.
Cadillac-Meters. Central Station Steam Co., Detroit, Mich.
Calco Spray—Insulation. United States Mineral Wool Co., Stanhope, N. J.
Calco—Valves. California Brass Mfg. Co., Los Angeles, Calif.
Cal-Fin—Pipe, radiation. Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Calktite—Cement and compounds. U. S. Stoneware Co., New York, N. Y.
Calorex—Oil burners. W. N. Best Combustion Equipment Co., Inc., Carlstadt, N. J.
Caltemp—Insulation. Pabco Products, Inc., San Francisco, Calif.
Camomatic—Valves. Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Campbell—Regulators, controls. Fuel Reduction Corp., Chicago, Ill.
Capacilogs—Temperature recorders. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Capacitrols—Indicator - controllers. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

Capillary—Air washers. Clarage Fan Co., Kalamazoo, Mich.
Capillary—Air washers, humidifiers, cooling towers, unit air conditioners. Air & Refrigeration Corp., New York, N. Y.
Capitol—Boilers, hanger or brackets, heaters, radiation. National-U. S. Radiator Corp., Johnstown, Pa.
Capitolaire—Furnaces, radiation, air conditioning units. National-U. S. Radiator Corp., Johnstown, Pa.
CaPlugs—Fittings, plugs. Protective Closures Co., Inc., Buffalo, N. Y.
Caposil—Cement, insulation. North American Asbestos Corp., Chicago, Ill.
Caposite—Cement, insulation. North American Asbestos Corp., Chicago, Ill.
Carbolite—Soot destroyers. Ampion Corp., Long Island City, N. Y.
Carbozite—Coatings. Ohmlac Paint & Refining Co., Long Island City, N. Y.
Careycel—Insulation. Philip Carey Mfg. Co., Cincinnati, O.
Cash-Acme—Heating systems, feeders, pipe strainers, regulators, valves. Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cassel—Templates. Graphic Indicator Co., Los Angeles, Calif.
Castalu—Fans, wheels. Advance Aluminum Castings Corp., Chicago, Ill.
Cast-Refract—Refractories. Quigley Co., Inc., New York, N. Y.
Catalina—Radiators, electric. Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Catch-All—Dehydrators and filters. Sporlan Valve Co., St. Louis, Mo.
Cat's Eye—Observation ports. Ess Instrument Co., Bergenfield, N. J.
Causul—Valves. Lunkenheimer Co., Cincinnati, O.
CC Coatings—Protective coatings, paint. Chemical Solvent Co., Birmingham, Ala.
Cell concrete—Concrete. Dockstader, Inc., S. E., Washington, D. C.
Cell-U-Blanket—Insulation. Masonite Corp., Chicago, Ill.
Cellufoam—Insulation. Masonite Corp., Chicago, Ill.
Celoron—Couplings. Continental-Diamond Fibre, Newark, Del.
Cemcoat—Enamels and lacquers. Sonneborn Sons, Inc., New York, N. Y.
Cementseal—Enamels and lacquers. Acorn Paint and Chemical Co., Cleveland, O.
CenTraVac—Compressors. Trane Co., The, La Crosse, Wis.
Centri-Chem—Centrifugal pumps. Eco Engineering Co., Newark, N. J.
Centrimax—Meters. Leeds & Northrup Co., Philadelphia, Pa.
Centripac—Packing. Johns-Manville, New York, N. Y.
Centripeller—Roof ventilators. Jordan & Co., Paul R., Indianapolis, Ind.
Century—Pipe. Keasbey & Mattison Co., Ambler, Pa.
Century—Boilers. Smith Co., Inc., H. B., The, Westfield, Mass.
Certified Climate—Air conditioning units, washers. Parks-Cramer Co., Fitchburg, Mass.
Cesco—Fittings. Columbia Engineering Service Co., Santa Rosa, Calif.
C-Flux—Solder and fluxes. American Solder & Flux Co., Philadelphia, Pa.
Challenger—Propeller fans. Signal Electric Div. of King-Seeley Corp., Menominee, Mich.
Chamfer-Trade—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Champion—Furnaces, heaters. National Heater Co., St. Paul, Minn.
Champion—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Champion—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Chan-L-Mounts—Bases and pads. Lord Mfg. Co., Erie, Pa.
Charg-A-Can—Refrigerants. American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif.
Chemical—Gaskets, joints, packing, couplings. United States Gasket Co., Camden, N. J.
Chemiseal—Seals, shaft. United States Gasket Co., Camden, N. J.
Chem-o-Feeder—Feeders, pumps, water treatment. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chem-O-Shot—Pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chempac—Gaskets, packing. Johns-Manville, New York, N. Y.
Chenco P-24—Feeders. Chemical Engineering Co., Dallas, Tex.
Chenco—Compounds, filters, water treatment, softeners. Chemical Engineering Co., Dallas, Tex.
Chevron—Packing. Garlock Packing Co., Palmyra, N. Y.
Chicago—Brakes. Dreis & Krump Mfg. Co., Chicago, Ill.
Chicago—Bolts and drills. Chicago Expansion Bolt Co., Chicago, Ill.
Chief Thred-O-Matic—Pipe cutting machines. Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.
Chill Air—Air conditioning units, fans. National Engineerng & Mfg. Co., Sedalia, Mo.
CHILL VACTOR—Chillers and steam jet compressors. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Chimney Crown—Caps. Coleman Co., Inc., The, Wichita, Kans.
Chimney Sweep—Chemical destroyers. Coughlan Co., G. N., West Orange, N. J.
Chinook—Ferrous heating surface. Bayley Blower Co., Milwaukee, Wis.
Chlorimet—Heat exchangers, fans, fittings, heaters, pipe, pumps, sheets, valves. Duriron Co., Inc., The, Dayton, O.
Chlorinizer—Chlorinators, and treatment. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chlor-O-Feeder—Feeders, pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chlor-O-Mite—Pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chore Boy—Burners. Standard Fuel Engineering Co., Detroit, Mich.
Chromalox—Preheaters, dryers, indicators-controllers, heating systems, supercheaters, thermostats, unit heaters. Wiegaud Co., Edwin L., Pittsburgh, Pa.
Chrome—Packing, Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Chrome Lock—Gaskets, tape. Products Research Co., Los Angeles, Calif.
Chromend—Electrodes. Arcos Corp., Philadelphia, Pa.
Chromix—Refractories. Quigley Co., Inc., New York, N. Y.
Chronoflo—Flow meters, gages, recorders. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chronometer—Valves. Defender Instrument & Regulator Co., St. Louis, Mo.
Chronotherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis.
Chil-Lator—Coolers. McQuay, Inc., Minneapolis, Minn.
Cinch—Expansion bolts. National Lead Co. New York, N. Y.
Circle-Air—Convection radiation. Paley Mfg. Corp., Brooklyn, N. Y.
Circle Seal—Valves. James-Pond-Clark, Pasadena, Calif.
Circle T—Switches. Trumbull Dept., General Electric Co., Plainville, Conn.
Circu-Ray—Heaters. Temco, Inc., Nashville, Tenn.
Clair-Tex—Connections. St. Clair Rubber Co., Detroit, Mich.
Clamp-A-Leak—Pipe repair clamps. Chelsea Metal Stamping Co., New York, N. Y.
Clarco—Unit heaters. Clarage Fan Co., Kalamazoo, Mich.
Cla Rite—Filters. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Classic—Registers. Auer Register Co., Cleveland, O.
Claymont—Steel pipes. Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Clean Right—Soot destroyers. General Filters, Inc., Novi, Mich.
Clear-stream—Treatment. Reynolds Shaffer Co., Detroit, Mich.
Clearstream—Hose, nonmetal; pipe fittings; plastic pipe; plastic tubing. Yardley Plastic Co., Columbus, O.
Clearview—Gages. Boston Machine Works Co., Lynn, Mass.
Clevite—Bearings. Cleveland Graphite Bronze Co., Cleveland, O.
Cliff—Boilers, water heaters. Terre Haute Boiler Works Co., Terre Haute, Ind.
Climate Changer—Unit air conditioners. Trane Co., The, LaCrosse, Wis.
Climate-Lab—Test chambers. American Instrument Co., Inc., Silver Spring, Md.
Climatrol—Boilers, furnaces, heaters, fans, metallic ducts, air conditioning units. Mueller Climatrol, Milwaukee, Wis.
Climax—Governors, regulators, strainers, steam traps, valves. Black, Sivalls & Bryson Inc., Kansas City, Mo.
Clipper—Fans. Trade-Wind Motorfans, Inc., Rivera, Calif.
Clipper—Seals. Johns-Manville, New York.
Clorodine—Boiler cleaning compounds. American Chemical Paint Co., Ambler, Pa.
Closin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Cocheo—Belting. Williams & Son, I. B., Dover, N. H.
Coeco—Controls and dampers. Combustion Equipment Co., Moline, Ill.
Colalloy—Couplings, nipples, pipe. Colonial Alloys Co. Metals Div., Philadelphia, Pa.
Cold Generator—Chillers. Trane Co., The, La Crosse, Wis.
Coltemp—Insulation. Badham Insulation Co., Inc., Birmingham, Ala.
Columbia—Water heaters, air conditioning units. National Steel Construction Co., Logansport, Ind.
Columbia—Odor adsorbers, air conditioning units. Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York, N. Y.
Columbia—Ventilators. E. E. Souther Iron Co., St. Louis, Mo.
Combi-Matic—Burners. Siemon Mfg. Co., Grandview, Mo.
Combustioner—Furnaces, humidifiers, stokers. Steel Products Engineering Co., Springfield, O.
Comet—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Comfort Control—Temperature regulators. Bell & Gossett Co., Morton Grove, Ill.
Comfortaire—Air conditioning units. American Coils Co., Newark, N. J.
Comfortrol—Thermostats. Sullivan Valve & Engineering Co., Butte, Mont.
Comfostat—Thermostats. Johnson Service Co., Milwaukee, Wis.
Cominco—Insulating cement. United States Mineral Wool Co., Stanhope, N. J.
Commercial-Aire—Heaters. Mammoth Furnace Co., St. Paul, Minn.
Compact—Boilers. Titusville Iron Works Co., The, Titusville, Pa.
Compacto—Furnaces. Mammoth Furnace Co., St. Paul, Mnnn.
Compass—Belting. Goodyear Tire & Rubber Co., Akron, O.
Compound Lever—Hand shears and snips. Bartlett Mfg. Co., Detroit, Mich.
Concavex—Bearings. Shafer Bearing Div. of Chain Belt Co., Downers Grove, Ill.
Conco—Boiler cleaning compounds, water treatment. Continental Products Co., Euclid, O.
Condor—Belting, v-belts, pipe. Raybestos-Manhattan, Inc., Passaic, N. J.
Condo-Vac—Vacuum pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Conflex—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Coni-Vane—Ventilators. Allen Cooler & Ventilator, Inc., Rochester, Mich.
Conomotors—Duct and valve operators. Conoflow Corp., Philadelphia, Pa.
Conseco—Water chillers, tube cleaners, coils, compressors, condensers, oil coolers, dryers, heat exchangers, filters, headers, water heaters, joints, preheaters, separators, superheaters, tanks. Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Conservo—Towers. Aqua-Therm, Inc. Dayton, O.
Consolaire—Air Conditioning Units. Remington Air Conditioning Div., Remington Corp., Auburn, N.Y.
Consolidated—Valves. Manning, Maxwell & Moore, Inc., Stratford, Conn.
Constellation Line—Arc welders. Trindl Products, Ltd., Chicago, Ill.
Con-Tac-Ton—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Continental—Boilers. Boiler Engineering & Supply Co., Inc., Phoenixville, Pa.
Continental—Heaters. National Steel Construction Co., Logansport, Ind.
Continuous Flow—Heating Systems. Webster & Co., Warren, Camden, N. J.
Control-by-the-Weather—Heating control. Webster & Co., Warren, Camden, N. J.
Convector—Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.
Converto—Roof ventilators. Ammerman Co., C. L., Minneapolis, Minn.
Conveyoflo—Conveyors. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Conveyor—Pulleys and Sheaves. The American Pulley Co., Philadelphia, Pa.
Cool-A-Matic—Air conditioning units. Automatic Firing Corp., St. Louis, Mo.
Coolero—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Coolite—Windows. Mississippi Glass Co., St. Louis, Mo.
Coolmaster—Unit coolers. Kramer Trenton Co., Trenton, N. J.
Cool Spot—Propeller fans. Signal Electric Div. of King-Seeley Corp., Menominee, Mich.
Copaltite—Cement and compounds, gaskets. National Engineering Products, Inc., Washington, D. C.
Cop-R-Loy—Sheets. Wheeling Steel Corp., Wheeling, W. Va.
Copr-fibre—Insulation. Forty-Eight Insulations, Inc., Aurora, Ill.
Copr-Tube—Fittings. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Copyflex—Blueprint machine. Bruning Co., Inc., Charles, Chicago, Ill.
Coravol—Corrosion treatment. Western Chemical Co., Kansas City, Mo.
Cordan—Leather belting and V belts. Sikes Co., S. R., Minneapolis, Minn.
Cor-In Galvanode—Electrolytic devices. Rotometals, San Francisco, Calif.
Cork-Flex—Bases and pad, noise elimination for cooling towers. Vibration Mounting, Inc., Elmhurst, N. Y.

Cork-Rib—Bases and pad. Vibration Mounting, Inc., Elmhurst, N. Y.
Corox—Heaters. Westinghouse Electric Corp., Pittsburgh, Pa.
Corrocote—Coatings. Chemical Coatings & Engineering Co., Edgemont, Pa.
Corrodicide—Water treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Corrodine—Corrosion inhibition. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Corruflex—Expansion joints. American District Steam Div. of ADSCO Industries, Buffalo, N.Y.
Corson-Cerveny Micro-Bellows Pump—Feeders. Research Appliance Co., Pittsburgh, Pa.
Cosmolubric—Refrigeration oil. Houghton & Co., E. F., Philadelphia, Pa.
Cottrell—Dust collectors. Western Precipitation Corp., Los Angeles, Calif.
Counterflo—Furnaces. Dravo Corp., Machinery Div., Pittsburgh, Pa.
Cox—Water heaters. O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
Coxe—Stokers. Combustion Engineering, Inc., New York, N. Y.
Co-Z-Air—Electric radiators. Conco Engineering Wks., Div. of H. D. Conkey & Co., Mendota, Ill.
Crag—Treatment. Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N.Y.
Crescent—Boiler gage cocks, Wright-Austin Co., Detroit, Mich.
Crescent—Valves. Powell Co., Wm., The, Cincinnati, O.
Cresline—Plastic fittings, pipe, tubing. Crescent Plastics, Inc., Evansville, Ind.
Crest—Water heaters. Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
Croloy—Pipe, tubes, and tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Cromaloy—Solder. Linde Air Products Co., The, Unit of Union Carbide & Carbon Corp., New York, N. Y.
Cross-Flo—Dehydrators. Remco, Inc., Zelienople, Pa.
Crown—Cement and compounds. Colebrook & Sons, Inc., W. H., Syracuse, N. Y.
Cryscoat—Protective coatings. Oakite Products, Inc., New York, N. Y.
Crystals—Enamels and lacquers. Hilo Varnish Corp., Brooklyn, N. Y.
Crystolon—Refractories and refractory cement. Norton Co., Worcester, Mass.
Cummins—Drills. Oster Mfg. Co., John, Milwaukee, Wis.
Cushioned Power—Valves. White-Rogers Electric Co., St. Louis, Mo.
Custom Built—Unit air conditioners. Baker Refrigeration Corp., South Windham, Me.
Cut Master—Vertical turret lathes. Bullard Co., The, Bridgeport, Conn.
Cutno—Packing. Greene, Tweed & Co., North Wales, Pa.
Cut-O-Matic—Flame cutters. National Cylinder Gas Co., Chicago, Ill.
Cut Trade—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Cycoil—Filters. American Air Filter Co., Louisville, Ky.
Cyclon—Plastic tubing. Munray Products, Inc., Cleveland, O.
Cyclone—Exhaust heads. Wright Austin Co., Detroit, Mich.
Cyclone—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Cyclonetic—Burners. Webster Engineering Co., Tulsa, Okla.
Cyclops—Roller bearings. Roller Bearing Co. of America, West Trenton, N. J.
Cyclothene—Plastic tubing. Munray Products, Inc., Cleveland, O.

DFN—Dehydrators, filters, strainers. McIntire Co., The, Livingston, N. J.
DH—Ball bearings. Dodge Mfg. Corp., Mishawaka, Ind.
D.I.P.—Bends, insulation, piping. Durant Insulated Pipe Co., Palo Alto, Calif.
D.I.P.—Insulation, piping. Durant International Corp., Williamstown, N. J.
DNP—Heaters. Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
D-O—Adsorbers. Research Products Corp., Madison, Wis.
D-O Kote—Adsorbers. Research Products Corp., Madison, Wis.
DRC-Blue Circle—Baseboard radiation. Dunkirk Radiator Corp., Dunkirk, N. Y.
DX—Softeners. Stover Water Softener Co., St. Charles, Ill.
Damperset—Regulators. Elgen Mfg. Co., Long Island City, N.Y.
Darcova—Packing. Sims Pump Valve Co., Hoboken, N. J.
Dart—Unions. Fairbanks Co., The, New York, N. Y.
Day-Nite Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Day-Steel—Pulleys. Dayton Rubber Co., Dayton, O.
Dean—Cleaners. Pierce Co., Wm. B., The, Buffalo, N. Y.
Debecote—Coatings. Debevoise Co., The, Brooklyn, N. Y.
Deflectrol—Turning vanes. Barber-Colman Co., Rockford, Ill.
Defrostolator—Hot gas defrosting systems. Tenney Engineering, Inc., Union, N. J.
Dehydrators—Dehumidifiers. Selas Corp. of America, Philadelphia, Pa.
Dekoron—Protective coatings, tubing. Moore & Co., Samuel, Mantua, O.
Delatrol—Valves. Webster Electric Co., Racine, Wis.
Delta—Steel boilers. Zingham Co., William C., Chicago, Ill.
Demandtrol—Valves. Sullivan Valve & Engineering Co., Butte, Mont.
Demi—Valves. Dahl, G. W., Bristol, R. I.
Demon Air-Set—Refractories. Plibrico Firebrick Co., Chicago, Ill.
Densitron—Alarms. Ripley Co., Inc., Middletown, Conn.
Deoxidine—Cleaning compounds. American Chemical Paint Co., Ambler, Pa.
Dereka—Protective coatings. Debevoise Co., The, Brooklyn, N. Y.
Desmond Simplex—Pipe vises. Desmond-Stephan Mfg. Co., Urbana, O.
De-Sta-Co.—Fan housings, pipe clamps, valves. Detroit Stamping Co., Detroit, Mich.
Detect-A-Fire—Controls. Fenwal Inc., Ashland, Mass.
Detroit—Traps. Nason Co., Clarkston, Mich.
Dexter—Valve reseaters, air separators, steam traps. Leavitt Machine Co., Orange, Mass.
Dexter Auto Sep—Filters. Leavitt Machine Co., Orange, Mass.
Di-Acro—Benders, brakes, machines, shears. O'Neil Irwin Mfg. Co., Lake City, Minn.
Dial-A-Speed—Motors. Brown-Brockmeyer Co., Inc., Dayton, O.
Dialon—Radiator valves. Bridgeport Brass Co., Bridgeport, Conn.
Diamond—Compounds, enamels and lacquers. Thompson and Co., Oakmont, Pa.
Diamond Fibre—Gaskets. Continental Diamond Fibre, Newark, Del.
Diamond H—Switches, thermostats, relays. Hart Mfg. Co., Hartford, Conn.
Diaphlex—Bellows, relays, solenoids, and switches. Cook Electric Co., Chicago, Ill.
Dia Seal—Valves. Imperial Brass Mfg. Co., Chicago, Ill.
Diesel American—Oil burners. Diesel Oil Burner Corp. of New York, Jamaica, Long Island, N. Y.
Dieselite—Corrosion prevention. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Diffusaire—Diffusers. Hart & Cooley Mfg. Co., Holland, Mich.
Dilecto—Plastic pipe and tubing. Continental Diamond-Fibre, Newark, Del.
Dill Dust Spot Tester—Tester, dust spot. Research Appliance Co., Pittsburgh, Pa.
Dimetcote—Coatings, paint. Amercoat Corp., South Gate, Calif.
Directrol—Vanes. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Discfin—Cooling surface. General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Distributor—Radiation. Kehm Corp., The, Chicago, Ill.
Divco—Fittings, coils, pipe and tubing, sheets, plugs, solder, valves. Division Lead Co., Summit, Ill.
Dixigas—Gas welding rod. Atlantic Steel Co., Atlanta, Ga.
Do-All—Combination hammer and drill. Wodack Electric Tool Corp., Chicago, Ill.
Dodge-Timken SC—Bearings. Dodge Mfg. Corp., Mishawaka, Ind.
Do-Mor—Saw tools. Pioneer Tool Co., Racine, Wis.
Dominion—Gaskets, packing. Darcoid Co., Inc., New York, N. Y.
Dorex—Adsorbers. Connor Engineering Corp., Danbury, Conn.
Doro-Chrome—Benders, cutters, tools, wrenches. Duro Metal Products Co., Chicago, Ill.
Double Check—Boiler compounds. Hampton Cross Co., The, Louisville, Ky.
Double Diamond—Hygrometers, recorders, psychrometers, thermometers. H-B Instrument Co., Philadelphia, Pa.
Double-Flow—Cooling towers. Marley Co., The, Kansas City, Mo.
Double Retort Stoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Double-Seal—Copper tube fittings. Hays Mfg. Co., Erie, Pa.
Doubleton—Pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Dowflake—Dehumidifiers. Dow Chemical Co., The, Midland, Mich.
Dowmetal—Angles, sheets, tubing, welding rod. Dow Chemical Co., Midland, Mich.
Downblast—Unit heaters. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Dowtherm—Process heating systems. Dow Chemical Co., The, Midland, Mich.
Dowtherm—Systems. Dow Chemical Co., The, Midland, Mich.
Draft-A-Justor—Draft controls. Preferred Utilities Mfg. Corp., New York, N. Y.
Draftender—Regulators. Penn Controls, Inc., Goshen, Ind.
Draft King—Caps, vent, flue. Wood Mfg. Co., A. R., Luverne, Mich.
Draft Korektor—Controls. Cole-Sewell Engineering Co., St. Paul, Minn.
Draft-O-Stat—Barometric controls. Hotstream Heater Co., Cleveland, O.
Draftstop—Ventilators. American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
Draftrite—Gages. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Draftrite—Gages. Cole-Sewell Engineering Co., St. Paul, Minn.
Dragnet—Leak detectors, testers. Universal Controls Corp., Dallas, Tex.
Drainator—Traps. Coe Mfg. Co., Painesville, O.
Drain-Dri—Sump pumps. Yeomans Bros. Co., Melrose Park, Ill.
Draintrol—Traps. Schaub Engineering Co., Fred H., Chicago, Ill.
Dri-Pipe—Insulation. Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
Drip-pump—Pumps. Peerless of America, Inc., Chicago, Ill.
Drive-IT—Hangers and supports, fasteners. Powder Power Tool Corp., Portland, Ore.
Dri-vent—Radiator air valves. Frank D. Riggio Co., Rutherford, N. J.
Dry-Eye—Dehydrators. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Dry-Ex—Water chillers. Acme Industries, Inc., Jackson, Mich.
Dryfol—Insulation. Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.
Dry-Ice—Refrigerants. Pure Carbonic, Co., Div. of Air Reduction Co., Inc., New York.
Dryvin—Expansion bolts. Star Expansion Bolt Co., New York, N. Y.
Dualarc—Arc Welders. Electric Arc, Inc., Newark, N. J.
Dual-Clone—Dust collectors. Day Co., The, Minneapolis, Minn.
Dual-Dial—Gages. Rochester Mfg. Co., Inc., Rochester, N. Y.
Dual-A-Fire—Burners. Automatic Firing Corp., St. Louis, Mo.
Dualene—Fuel oil treatment. Allen Co., Robert G., Mechanicsville, N. Y.
Dualsteel—Unions. Rockwood Sprinkler Co., Worcester, Mass.
Dualvent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Duboth—Boiler water treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Duclone—Cyclone dust collectors. Ducon Co., The, Mineola, N. Y.
Duco—Enamels and lacquers, du Pont de Nemours & Co., (Inc.), E. I., Finishes Div., Wilmington, Del.
Ductatherm—Thermostats. Mercoid Corp., The, Chicago, Ill.
Ducturns—Vanes. Tuttle & Bailey, Inc., New Britain, Conn.
Ductype—Fans. South Bend Air Products, Inc., South Bend, Ind.
Dulux—Enamels and lacquers. du Pont de Nemours & Co., (Inc.), E. I., Finishes Div., Wilmington, Del.
Dum Dum—Sealing compounds. Arco Co., The, Cleveland, O.
Duo Blo—Air heaters. American Furnace Co., St. Louis, Mo.
Duonetic—Gas and oil burners. Webster Engineering Co., Tulsa, Okla.
Duo-Stat—Heating systems, thermostats. Johnson Service Co., Milwaukee, Wis.
Duotrol—Regulators, switches. Automatic Control Co., St. Paul, Minn.
Duplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Duplex—Pipe cutting machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
DuraBilt—Registers. Auer Register Co., Cleveland, O.
Dura-Flex—Registers. Auer Register Co., Cleveland, O.
Duraflex—Stokers. Canton Stoker Corp., Canton, O.
Dura-Line—Registers. Auer Register Co., Cleveland, O.
Duranite—Enamels and lacquers. Atlas Powder Co., North Chicago, Ill.
DuraSpeed—Sprinkler heads. Grinnell Co., Inc., Providence, R. I.
Duratex—Adhesives and protective coatings. National Pipe Coating, Inc., Huntington Park, Calif.
Durco—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.
Durcopump—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.
Durex—Bearings. Moraine Products Div., General Motors Corp., Dayton, O.
Durichlor—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.

Duridine—Protective coatings. American Chemical Paint Co., Ambler, Pa.

Durimet—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.

Duro-Blade—Regulators. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.

Duro-Metal-FAB—Duct connections, ducts and duct fittings. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.

Durospead—Heads. Grinnell Co., Inc., Providence, R.I.

Duro-Van—Vanes. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.

Dur X—Plastic fittings and pipes. Franklin Plastics, Inc., Franklin, Pa.

Dustav—Filters. Air-Maze Corp., Cleveland, O.

Dust King—Dust collectors. Dust Filter Co., Chicago, Ill.

Dustkop—Dust collectors. Aget-Detroit Co., Ann Arbor, Mich.

Dust-Stop—Air Filters. Owens-Corning Fiberglas Corp., Toledo, O.

Dustube—Dust collectors. Wheelabrator Corp., Mishawaka, Ind.

Dutch Boy—Solder, enamels and lacquers. National Lead Co., New York, N. Y.

Dutch Master—Collectors. Banister Co., Inc., Cambridge, Mass.

Duxbak—Leather belting and packing. Schieren Co., Chas. A., New York, N. Y.

Dux-Sulation—Insulation. Grant Wilson, Inc., Chicago, Ill.

Dy-Chek—Dye penetrant. Turco Products, Inc., Los Angeles, Calif.

Dynafan—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.

Dynaflow—Fans. South Bend Air Products, Inc., South Bend, Ind.

Dyna Line—Electric motors, reducers. Brown-Brockmeyer Co., Inc., Dayton, O.

Dynamaster—Recorders. Bristol Co., The, Waterbury, Conn.

Dynapump—Circulators, pumps. Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.

Dyna-Speed—Electric motors. Brown-Brockmeyer Co., Inc., Dayton, O.

Dyne-Aire—Heaters. American Foundry & Furnace Co., Bloomington, Ill.

Dynetic—Gas burners. Webster Engineering Co., Tulsa, Okla.

Dynetric—Balancing equipment. Gisholt Machine Co., Madison, Wis.

E C—V belts. Goodyear Tire & Rubber Co., Akron, O.

E C & M—Motor controls, switches. Electric Controller & Mfg. Co., Cleveland, O.

EMD—Blowers. L. J. Wing Mfg. Co., Linden, N. J.

E-Z—Registers, regulators. Acme Mfg. Co., Philadelphia, Pa.

E-Z—Hangers or brackets, Inserts. Healey Ruff Co., St. Paul, Minn.

Easy-Flo—Solder. Handy & Harman, New York, N. Y.

Ebko—Bends, conduit, preheaters, exchangers, pipe. Kaiser Co., E. B., Glenview, Ill.

Eclipse—Reciprocating compressors. Frick Co., Waynesboro, Pa.

Econ-O-Fab—Duct connections, ducts and duct fittings. Duro-Dyne Corp., New Hyde Park, Long Island, N.Y.

Econofeed—Pumps, systems. Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.

Econ-O-Flow—Furnaces. Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.

Econ-O-Matic—Motor bases. American Pulley Co., The, Philadelphia, Pa.

Economist—Boilers. Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.

Economite—Commercial and industrial gas burners. Mid-Continent Metal Products Co., Chicago, Ill.

Economizer—Nozzles. Bahnson Co., Winston-Salem, N. C.

Economy—Unit ventilators. Arex Co., Chicago, Ill.

Econostat—Heating systems. Barber-Colman Co., Rockford, Ill.

Econotherm—Boilers. Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.

Econotowers—Cooling towers. Santa Fe Tank & Tower Co. of Texas, Garland, Texas

Econovent—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.

Edgeseal—Air filters. Wilson & Co., Inc., Chicago, Ill.

Edgetallic—Gaskets. Darcoid Co., Inc., New York, N. Y.

Effico—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

"88"—Pipe covering. Eagle-Picher Co., Cincinnati, O.

Ejectopump—Pumps. Ferro Corp., Cleveland, O.

Elastic Metallic—Packing. Chesterton Co., A. W., Everett, Mass.

Elastic Porcelain—Tank linings. Porce-Lin Tank Lining Co., Detroit, Mich.

Elasto Rib—Vibration isolating bases. Korfund Co., Inc., Long Island City, N. Y.

Elaterite—Coatings. Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y.

Electranik—Indicator-controllers. Minneapolis-Honeywell Regulator Co., Instruments Div., Philadelphia, Pa.

Electric Filter Watchman—Gages. Herbusch Corp., The, St. Louis, Mo.

Electric Water Boy—Sump pumps. Weil Pump Co., Chicago, Ill.

Electrifugal—Centrifugal pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Electro-Airmat—Air cleaners. American Air Filter Co., Inc., Louisville, Ky.

Electro-Cell—Air cleaners. American Air Filter Co., Inc., Louisville, Ky.

Electrollo—Valves. Hays Mfg. Co., Erie, Pa.

Electro-Klean—Air cleaners. American Air Filter Co., Inc., Louisville, Ky.

Electromaze—Cleaners. Air-Maze Corp., Cleveland, O.

Electro-Mist Collector—Air cleaners. American Air Filter Co., Inc., Louisville, Ky.

Electro-Pl—Air cleaners. American Air Filter Co., Inc., Louisville, Ky.

Electro Rod—Pipe cleaning machines. Spartan Tool Co., Chicago, Ill.

Electro-Sheet—Sheets. American Brass Co., Waterbury, Conn.

Electro-Staynew—Air cleaners. Dollinger Corp., Rochester, N. Y.

Electroweld—Welders. Electric Arc., Inc., Newark, N. J.

Electro-Wind—Ventilators. Allen Cooler & Ventilator Inc., Rochester, Mich.

electrunite—Stainless steel tubing and pipe, tubing benders. Republic Steel Corp., Steel & Tubes Div., Cleveland, O.

Elesco—Superheaters. Combustion Engineering, Inc., New York, N. Y.

Elgex—Steam system treatment. Elgin Softener Corp., Elgin, Ill.

Elgin—Arc welders. Borm Mfg. Co., Elgin, Ill.

Elgin—Louvers and shutters. Elgo Shutter & Mfg. Co., Detroit, Mich.

Elm—Dampers. Elgo Shutter & Mfg. Co., Detroit, Mich.

Elno—Electrolytic devices. Cleveland Heater Co., Cleveland, O.

Embee—Cement and compounds. Montgomery Bros., San Francisco, Calif.

Emco—Meters, regulators. Pittsburgh Equitable Meter Div., Rockwell Mfg. Co., Pittsburgh, Pa.

End-Com—Blowers. Wing Mfg. Co., L. J., Linden, N. J.

Empire—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Empire—Water meters. Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.

Enco—Burners, regulators, cooling units. Engineer Co., New York, N. Y.

Enduro—Hose. Continental Rubber Wks., Erie, Pa.

Enduro—Sheets, tubing, pipe. Republic Steel Corp., Steel & Tubes Div., Cleveland, O.

Enduro—Unions. Jefferson Union Co., Inc., New York, N. Y.

Entrained Combustion—Gas burners. Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.

Equalizer—Deaerators, feeders, systems, traps. Acer Orgn., Inc., W. M., Meridian, Miss.

Equatemp—Balancing valves. Ohio Brass Co., Mansfield, O.

Equa-Trol—Valves. Hi-Flow Products, Inc., Copiague, N. Y.

Equavalve—Pipe fittings & valves. Hi-Flow Products, Inc., Copiague, N. Y.

Ermeto—Fittings. Weatherhead Co., The, Cleveland, O.

Eroduct—Insulation. Ehret Magnesia Mfg. Co., Valley Forge, Pa.

Esco—Fittings, flanges, pipe, exchangers. Electric Steel Foundry Co., Portland, Ore.

Esco Spuncast—Pipe, tubing. Electric Steel Foundry Co., Portland, Ore.

Esso—Oil burners, heaters. Gilbert & Barker Mfg. Co., West Springfield, Mass.

Esso Bond—Cement, refractories. Ramtite Co., The, Chicago, Ill.

Eutec Arc—Arc welders, welding and cutting apparatus. Eutectic Welding Alloys Corp., Flushing, N. Y.

EuteChron—Welding Electrodes, rods. Eutectic Welding Alloys Corp., Flushing, N.Y.

Eutec Rod—Welding compounds, rods, solder. Eutectic Welding Alloys Corp., Flushing, N. Y.

Eutec TinWeld—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.

Eutector Flux—Welding compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.

Eutecto Film—Solder. Eutectic Welding Alloys Corp., Flushing, N.Y.

Eutecto-Mask—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.

EutecTorch—Torches, welding and cutting apparatus. Eutectic Welding Alloys Corp., Flushing, N. Y.

EutecTrode—Welding electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.

EVACTOR—Heaters and pumps. Croll-Reynolds Engineering Co., Inc., New York, N. Y.

Evanaction—Valves. Taylor Instrument Companies, Rochester, N. Y.

Eveco—Controls. Empire Ventilation Equipment Co., Long Island City, N. Y.

Everbrite—Paint. Warren Refining & Chemical Co., The, Cleveland, O.

Everdri—Sump pumps, Wade Mfg. Co., Elgin, Ill.

Everjet—Coatings, Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.

Evrtyte—Valves. Strong, Carlisle & Hammond Co., Cleveland, O.

Excel—Unions. Jefferson Union Co., Inc., New York, N. Y.

Excelsior—Pumps. Foster Pump Works, Inc., Brooklyn, N. Y.

Excelso—Water heaters. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Exhaustair—Fans. New York Blower Co., Chicago, Ill.

Expand-R-Strap—Fasteners. Gerrard & Co., A. J., Melrose Park, Ill.

Expandzorber—Joints. Flinn & Co., Inc., T. R., Hawthorne, N. J.

Expelsor—Ejectors. Yeomans Bros. Co., Melrose Park, Ill.

Explosimeter—Leak detectors. Mine Safety Appliances Co., Pittsburgh, Pa.

Extra Dry Esotoo—Liquid sulphur dioxide. Virginia Smelting Co., West Norfolk, Va.

Eye-Hye—Indicators. Reliance Gauge Column Co., Cleveland, O.

E-Z—Cutters. Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.

E-Z—Hangers and Supports, regulators. Acme Mfg. Co., Holmesburg, Philadelphia, Pa.

Ez-Arc—Arc welders. Will-Weld Mfg. Co., Inc., Omaha, Neb.

EZ Code—Electric wire. Western Lithograph Co., Los Angeles, Calif.

Ezkleen—Filters. Research Products Corp., Madison, Wis.

E-Z-On—Regulators. Gerrett Corp., M. A., Milwaukee, Wis.

E-Z See—Glasses. Remco, Inc., Zelienople, Pa.

Ezy-Kleen—Strainers. Blackmer Pump Co., Grand Rapids, Mich.

F & E—Stokers, and incinerators. Flynn & Emrich Co., Baltimore, Md.

FMI Particulate—Air filters. Flanders Mill, Inc., Riverhead, Long Island, N. Y.

FS—Bellows. Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.

F & T—Boilers. Farrar & Trefts, Buffalo, N. Y.

Fabri-Flex—Bases and pads. Vibration Mounting, Inc., Elmhurst, N. Y.

Fabrikated—Grilles, registers. Independent Register Co., Cleveland, O., New York.

Faceweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.

Faessler—Tube expanders, tube flaring tools. Key Co., East St. Louis, Ill.

Fan-Air—Gas burners. Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.

Fanmix—Burners. Coppus Engineering Corp., Worcester, Mass.

Fan-Pac—Fans. DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.

Far-Air—Air conditioning units, filters, humidifiers. Farr Co., Los Angeles, Calif.

Farragut—Packing. Darcoid Co., Inc., New York, N. Y.

Fast's—Couplings. Koppers Company, Inc., Metal Products Div., Baltimore, Md.

FauceHot—Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.

Favorite—Ratchet wrenches. Greene, Tweed & Co., North Wales, Pa.

Featherfin—Heating and cooling surface, unit coolers. Wing Mfg. Co., L. J., Linden, N. J.

Featherweight—Insulation. Keasbey & Mattison Co., Ambler, Pa.

Feather Weight—Exchangers. Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.

Featherweight—Unit heaters. Wing Mfg. Co., L. J., Linden, N. J.

Federal—Floats. Reichert Float & Mfg. Co., Toledo, O.

Feedrator—Chemical feeders. Fischer & Porter Co., Hatboro, Pa.

Fel-Pro—Gaskets, packing. Felt Products Mfg. Co., Chicago, Ill.

Fenn's Rotary—Ventilators. Waverly Heating Supply Co., Boston, Mass.

Ferrenewo—Valves. Lunkenheimer Co., Cincinnati, O.

Ferro-Therm—Insulation. American Flange & Mfg. Co., New York, N. Y.

Ferroweld—Electrodes. Lincoln Electric Co., Cleveland, O.

Ferulok—Fittings. Parker Appliance Co., The, Cleveland, O.

Fiberglas—Insulation. Owens-Corning Fiberglas Corp., Toledo, O.

Fiberlite—Insulation. Insulite Co., Minneapolis, Minn.

Fibrocel—Pipe insulation. Johns-Manville, New York, N. Y.
Fieldlink—Fittings. LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Fil-ter-All—Filters. Austin Engrg. & Mfg. Co., Inc. Ysleta (El Paso County) Tex.
Filter Watchman—Air filter gages. Research Products Corp., Madison, Wis.
Fil-Thru—Gages. Applied Mechanics Co., Boston, Mass.
Filtr-Aire—Filters. Peden Equipment Co., Houston, Tex.
Filtrex—Filters. Drico Industrial Corp., Passaic, N. J.
Filt-R-Stil—Water treatment. American Cyanamid & Chemical Corp., New York, N. Y.
Fine-Screen—Strainers. Yarnall-Waring Co., Philadelphia, Pa.
Fin-Flex—Registers. Auer Register Co., Cleveland, O.
Finger Strap—Fasteners. Gerrard & Co., A. J., Melrose Park, Ill.
Finmaster—Radiation. Smith Co., Inc., H. B. The, Westfield, Mass.
Finnflex—Bases, hangers. Finn & Co., Inc., T. R., Hawthorne, N. J.
Fin Pak—Radiation. Smith Co., Inc., H. B., The, Westfield, Mass.
Fin Ray—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Fin Vector—Radiation. Dunham Co., C. A., Chicago, Ill.
Fire Belle—Alarms. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Firecrete—Refractories. Johns-Manville, New York, N. Y.
Firefoil—Insulating panel. Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Fire-Hearth—Refractories. Fireline Stove & Furnace Lining Co., Chicago, Ill.
Fireite—Furnace cement, refractories. Johns-Manville, New York, N. Y.
Fireye—Alarms, flame failure controls, recorders, combustion control systems. Electronics Corp. of America, Cambridge, Mass.
Firma—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Firomatic—Filters, gages, links, switches, valves. Morse-Smith-Morse, Inc., Watertown, Mass.
Fitrite—Tools, roof ventilators. Levow, David, New York, N. Y.
Fixt-Aire—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
Flame Buster—Spray nozzles. Grinnell Co., Inc., Providence, R. I.
Flame-o-trol—Controls. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Flange-Jacks—Separators. Williams & Co., J. H., Buffalo, N. Y.
Flat-Belt—Pulleys and sheaves. The American Pulley Co., Philadelphia, Pa.
Flatjet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Fleet-Line—Motors. Brown-Brockmeyer Co., Inc., Dayton, O.
Fleetweld—Welding electrodes. Lincoln Electric Co., Cleveland, O.
Fleetwelder—Welders. Lincoln Electric Co., Cleveland, O.
Flex—Nipples. Techniflex Corp., Port Jervis, N. Y.
Flexarc—Arc welders. Westinghouse Electric Corp., Pittsburgh, Pa.
Flexazone—Air conditioning units. Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Flexcell—Bases and pads. Celotex Corp., The, Chicago, Ill.
Flexfast—Hose clamps. Flexible Tubing Corp., Guilford, Conn.
Flexflyte—Ducts and duct fittings, hose, tubing. Flexible Tubing Corp., Guilford, Conn.
Flexiblac—Protective coatings. Samuel Cabot, Inc., Boston, Mass.
Flexible Line—Fittings, hose. Dole Refrigerating Co., Chicago, Ill.
Flexibond—Protective coatings. Continental Products Co., Euclid, O.
Flexi-Duct—Connections. Grant Wilson, Inc., Chicago, Ill.
Flexidur—Nozzles. Bahnson Co., Winston-Salem, N. C.
Flexidyne—Couplings, drives. Dodge Mfg. Corp., Mishawaka, Ind.
Flexiflo—Diffusers. Universal Diffuser Corp., New York, N. Y.
Flexfelt—Insulation. National Gypsum Co., Buffalo, N. Y.
Flex-I-liner—Rotary pumps. Vanton Pump & Equipment Corp., Hillside, N. J.
Flexloc—Lock nuts. Standard Pressed Steel Co., Jenkintown, Pa.
FLEXODISC—Expansion joints. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
FLEXOLEED—Expansion joints. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Flexon—Bellows, pipe joints, ducts. Flexonics Corp., Maywood, Ill.
Flexon Expansion Compensator—Pipe joints. Flexonics Corp., Maywood, Ill.
Flexpansion—Fittings and hose. Techniflex Corp., Port Jervis, N. Y.

Flexpin—Couplings. Smith & Serrell, Inc., Newark, N. J.
FlexRing—Couplings. Smith & Serrell, Inc., Newark, N. J.
Flexitite—Gate valves. Ohio Brass Co., Mansfield, O.
Flextan—Packing. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Flex-Tube—Analyzers, gages, manometers, switches, pilot tubes. Dwyer Mfg. Co., F. W., Michigan City, Ind.
Flex Valve—Valves. Farris Flexible Valve Corp., Palisades Park, N. J.
Flexzorber—Adsorbers, hose. T. R. Finn & Co., Inc., Hawthorne, N. J.
Flo—Dehydrant and acid neutralizer, for refrigerating systems. Allin Mfg. Co., Chicago, Ill.
Floatrol—Switches, regulators. Automatic Control Co., St. Paul, Minn.
Flochek—Valves. Taco Heaters, Inc., Cranston, R. I.
Flocold—Unit coolers. Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Flo-Controls—Fittings. General Heaters & Regulators Co., East Chicago, Ind.
Floetless—Sump pumps. Imperial Brass Mfg. Co., Chicago, Ill.
Floguide—Flow meters. Fischer & Porter Co., Hatboro, Pa.
Flo-Klean—Filters. Cuno Engineering Corp., Meriden, Conn.
Flo-Master—Louvers and shutters. Acme Equipment Co., Muskogee, Okla.
Flo-Master—Valves. General Heaters & Regulators Co., Chicago, Ill.
Flo-Matic—Conveyors, stokers. American Coal Burner and Wood Stoker Corp., Chicago.
Floor-Level—Radiation. Rempe Co., Chicago, Ill.
Florite—Air velocity meters, and anemometers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Flo-Scope—Meters. Selas Corp. of America, Philadelphia, Pa.
Flotectic Flux—Welding compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Flotrol—Humidifiers, valves. Cleveland Humidifier Co., Cleveland, O.
Flo-Tube—Conveyors. Canton Stoker Corp., Canton, O.
Flo-watch—Flow meters. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Flow-Cold—Water chillers, compressors, coolers and towers. Acme Industries, Inc., Jackson, Mich.
Flowline—Pipe fittings, flanges. Welding Fittings Corp., New Castle, Pa.
Flowmaster—Pumps. Marco Co., Inc., Saginaw, Mich.
Flow-Mizer—Cooling towers. Acme Industries, Inc., Jackson, Mich.
Flowrator—Meters, systems. Fischer & Porter Co., Hatboro, Pa.
Flow-Temp—Air conditioning Units. Acme Industries, Inc., Jackson, Mich.
Flow-Therm—Chillers, compressors. Acme Industries, Inc., Jackson, Mich.
Flow Tube—Meters. Foster Engineering Co., Union, N. J.
Flualyzer—Analyzers. Engelhard, Inc., Chas., Newark, N. J.
Fluid Fortress—Fittings. Flodar Corp., Cleveland, O.
Fluid Joists—Coils. Fricke, Fred J., Albuquerque, N. M.
Fluidyne—Pumps. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Fluid-Tite—Pipe, asbestos. Keasbey & Mattison Co., Ambler, Pa.
Fluoroflex—Tubing. Resistoflex Corp., Belleville, N. J.
Flush-Kleen—Sewage ejectors and pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Flux-'N-Solder—Solder. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Flux-Stik—Solder and fluxes. Lake Chemical Co., Chicago, Ill.
Foambuster—Compounds. Cannon Chemical Co., Inc., Cambridge, Mass.
Foamglas—Insulation. Pittsburgh Corning Corp., Pittsburgh, Pa.
Foamglas—Insulation. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Force-Flo—Circulators, fittings, heaters, regulators, tanks. Kehm Corp., The, Chicago.
Force-Flo—Unit heaters. Trane Co., The, LaCrosse, Wis.
Ford Burnham—Boilers. Burnham Corp., Irvington, N. Y.
Form-A-Gasket—Cement and compounds. Permatex Co., Inc., Brooklyn, N. Y.
Form-A-Jig—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Formet—Water treatment. Perolin Co., Inc., Chicago, Ill.
Fosco—Water heaters. Shoedinger, Inc., F. O., Columbus, O.
"400" Series—Heaters. Fitzgibbons Boiler Co., Inc., New York, N. Y.
4-Star—Adhesive tape. Johns-Manville, New York, N. Y.

Fox—Regulators. Climax Metal Products Co., Cleveland, O.
Fracto Crete—Refractories. Ramtite Co., The, Chicago, Ill.
Francke—Flexible couplings. Waldron Corp., John, New Brunswick, N. J.
Francke Parts—Couplings. Smith & Serrell, Inc., Newark, N. J.
Franset—Cement, refractories and refractory cement. France Refractories Co., J. H., Snow Shoe, Pa.
Free-Aire—Air conditioning units, heaters. Kehm Corp., The, Chicago, Ill.
Free-Flow—Ventilators. Burt Mfg. Co., Akron, O.
Fre-Flo—Strainers. Fisher Governor, Marshalltown, Ia.
Freon—Refrigerants. E. I. du Pont de Nemours & Co., Inc., "Kinetic" Chemical Div., Wilmington, Del.
Frevent—Valves. Bridgeport Brass Co., Bridgeport, Conn.
Frigid Arc—Welding electrodes. Eutectic Welding Alloys Corp., Flushing, N.Y.
Frigid-Capri—Air conditioning units. Frigid, Inc., Brooklyn, N. Y.
Frigistat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Frogalloy—Electrodes. McKay Co., Pittsburgh, Pa.
Frost-Lite—Fittings. Remco, Inc., Zelienople, Pa.
Fuelguard—Commercial and industrial burners. Fuelguard Co., Dallas, Tex.
Fuelguard—Regulators. Ashcraft Co., J. P., Dallas, Tex.
Fuel Saver—Boilers. International Boiler Works Co., The, East Stroudsburg, Pa.
Fuel Saver—Regulators. Nichols Instruments Co., Baltimore, Md.
Fuelsaver—Controls, regulators. Walker Mfg. & Sales Co., St. Joseph, Mo.
Fueltone—Fuel oil treatment. Ampion Corp., Long Island City, N. Y.
Fuel-tron—Fuel oil treatment. Radiator Specialty Co., Charlotte, N. C.
Fulflo—Filters. Commercial Filters Corp., Melrose, Mass.
Fulgrip—Pulleys and sheaves. Maurey Mfg. Corp., Chicago, Ill.
Fulljet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Full-view—Meters. Brooks Rotameter Co., Lansdale, Pa.
Fulscope—Recorders, recorder controllers, regulators. Taylor Instrument Companies, Rochester, N. Y.
Fuseair—Air diffusers. Aladdin Heating Corp., San Leandro, Calif.
Fusionweld—Tubing. Avon Tube Div., Highbe Mfg. Co., Rochester, Mich.
Fusomatic—Links. Preferred Utilities Mfg. Corp., New York, N. Y.
Fybr-Tech—Gaskets and sheets. Technical Ply-Wood Sales, Chicago, Ill.
Fyr-Feeder—Stokers. American Coal Burner and Wood Stoker Corp., Chicago, Ill.
Fyrite—Analyzers, combustion testing kits. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Fyrite—Recorders. Cole-Sewell Engineering Co., St. Paul, Minn.
Fyritec—Recorders. Cole-Sewell Engineering Co., St. Paul, Minn.

GB—Fans. General Blower Co., Morton Grove, Ill.
G. B. C.—Gages, fans, regulators. Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
G-B Snap-On—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
G. E.—Compressors, condensers, thermostats. General Electric Co., Air Conditioning Dept., Bloomfield, N. J.
G-Fin—Cooling and heating surface, tubing. Griscom-Russell Co., The, Massillon, O.
GIL—Filters, regulators. Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
GIL Governoret—Valves. Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
GIL No-Hum—Check valves. Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
G-R—Aftercoolers, oil coolers, water chillers, exchangers. Griscom-Russell Co., The, Massillon, O.
GS—Anemometers, indicators, psychrometers. General Scientific Equipment Co., Philadelphia, Pa.
GT—Shaft Seals. Greene, Tweed & Co., North Wales, Pa.
Gaco—Couplings. Gates Engineering Co., Wilmington, Del.
Gaco-Neoprene—Coatings, fittings, pipe. Gates Engineering Co., Wilmington, Del.
Gagetron—Regulators. Instruments, Inc., Tulsa, Okla.
Galbestos—Sheet metal. Robertson Co., H. H., Pittsburgh, Pa.
Galongage—Gages. Applied Mechanics Co., Boston, Mass.
Galva-Lux—Enamels and lacquers. Acorn Paint and Chemical Co., Cleveland, O.

Galv-O-Zinc—Coatings. Blue Ridge Talc Co., Inc., Henry, Va.
Gascope—Leak detectors. Mine Safety Appliances Co., Pittsburgh, Pa.
Gasgun—Torches. Century Aircraft, Los Angeles, Calif.
Gas-A-Fire—Burners. Automatic Firing Corp., St. Louis, Mo.
Gas-O-Matic—Gas burners. Williams Div., Eureka Williams Corp., Div. of Henney Motor Co., Inc., Bloomington, Ill.
Gas Pak—Welding rod. Marquette Mfg. Co., Inc., Minneapolis, Minn.
Gask-o-Seal—Gaskets. Wolfe Co., Inc., The, Franklin C., Culver City, Calif.
Gast—Filters, separators. Johnson Corp., The, Three Rivers, Mich.
Gasteam—Radiators. Clow & Sons, James B., Chicago, Ill.
Gasweld—Torches, meters, solder and fluxes, regulators, welding rod and apparatus. Liquid Carbonic Corp., The, Chicago, Ill.
Gato—Valves. Barrett Machine Co., Pittsburgh, Pa.
Gavitt—Wire. American Hard Rubber Co., New York, N. Y.
Geddes—Radiation. Fowler & Wolfe Radiator Co., Norristown, Pa.
Gemco—Bolts, clamps, hangers and supports, nuts and washers, fasteners. Goodloe E. Moore, Inc., Danville, Ill.
Gemware—Hygrometers, psychrometers, thermometers, recorders, switches. G. M. Mfg. Co., New York, N. Y.
Genetron—Refrigerants. General Chemical Div., Allied Chemical & Dye Corp., New York, N. Y.
Gentile—Meters. Foster Engineering Co., Union, N. J.
Genuine Stillson—Wrenches. Walworth Co., New York, N. Y.
Geometric—Chasers. Greenfield Tap & Die Corp., Greenfield, Mass.
Giant—Radiation. John J. Nesbitt, Inc., Philadelphia, Pa.
Giant—Radiator hangers. Western Hanger Co., San Francisco, Calif.
Gilbarco—Compressors, oil burners, heaters, Pumps. Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilsonite—Protective coatings. Ohmlac Paint & Refining Co., Inc., New York, N. Y.
Gilt Edge—Belting. Rhoads & Sons, J. E., Wilmington, Del.
Gland-Pakt—Expansion joints. Yarnall-Waring Co., Philadelphia, Pa.
Glassheat—Conductors and panels. Continental Radiant Glass Heating Corp., New York, N. Y.
Glazecoat—Building insulation. Johns-Manville, New York, N. Y.
Glo Tech—Glass pipe. Fischer & Porter Co., Hatboro, Pa.
Glowan—Gas burners. Martin Co., Inc., J. O., San Francisco, Calif.
Glow-Top—Burners. Gordon & Piatt, Inc., Winfield, Kans.
Glucosates—Compounds, steam system treatment. Haering & Co., Inc., D. W., San Antonio, Tex.
Glycolator—Sterilizing units. Iron City Chemical and Construction Corp., Glycolator Sales & Service, Pittsburgh, Pa.
Glycosol—Sterilizing units. Iron City Chemical and Construction Corp., Glycolator Sales & Service, Pittsburgh, Pa.
Goetze—Gaskets. Johns-Manville, New York, N. Y.
Gohi—Sheets. Newport Rolling Mill Co., Newport, Ky.
Gold Bond—Insulation. National Gypsum Co., Buffalo, N. Y.
Good—Pumps. Goodfellow Co., Inc., E. D., Memphis, Tenn.
Goodyearite—Packing. Goodyear Tire & Rubber Co., Akron, O.
Grad-U-Motor—Damper operators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Gradustat—Regulators, thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Gradutrol—Diaphragm valves, radiator orifices. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Graham—Valves. Texsteam Corp., Houston, Tex.
Granco—Meters, pumps, strainers. Granberg Corp., Oakland, Calif.
Grand Rapids—Boiler vacuum cleaners. Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Granodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Granodraw—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Graycote—Cement and compounds. Chicago Gasket Co., Chicago, Ill.
Graylite—Insulation. Insulite Co., Minneapolis, Minn.
Greastop—Air filters. Air-Maze Corp., Cleveland, O.
Great Seal—Gaskets, packing, tape, valves. New York Belting & Packing Co., Passaic, N. J.
Greenspot—Hose clamps. Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Greyhound—Welders. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Grid—Unit coolers, radiation, unit heaters, humidifiers. Murray Mfg. Co., D. J., Wausau, Wis.
Griptube—Fittings. Flodar Corp., Cleveland.
Gripzins—Expansion bolts. Star Expansion Bolt Co., New York, N. Y.
Gritseald—Rotary pumps. St. Louis Tool Co., St. Louis, Mo.
Gruvagrip—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Grüvajoint—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Guardian—Gaskets. Garlock Packing Co., Palmyra, N. Y.
Guillotine—Cutters. Wachs Co., E. H. The, Chicago, Ill.
Gunchrome—Refractories and refractory cement. Basic Refractories, Inc., Cleveland.
Gundol—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Gun Mix—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Gun Pakt—Expansion joints. Yarnall-Waring Co., Philadelphia, Pa.
Guthfan—Fans. Guth Co., Edwin F., St. Louis, Mo.
Gyro Mass Meter—Meters. Control Engineering Corp., Controls Div., Norwood, Mass.
Gyrol Fluid Drive—Speed changer. American Blower Corp., Detroit, Mich.

H & C—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
H-O-H—Compounds, feeders, steam system and water treatment. Haering & Co., Inc., D. W., San Antonio, Tex.
HS—Fans. American Blower Corp., Detroit.
Hallowell—Bearings. Standard Pressed Steel Co., Jenkintown, Pa.
Hammerkraft—Enamels and lacquers. Hilo Varnish Corp., Brooklyn, N. Y.
Hammerlin—Coatings, enamels. Interchemical Corp., Newark, N. J.
Hammermill—Belting. Goodyear Tire & Rubber Co., Akron, O.
Hammer-on—Regulators. Air Control Products, Inc., Coopersville, Mich.
Hancock—Valves. Manning, Maxwell & Moore, Inc., Stratford, Conn.
Hand O Matic—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Handy—Valves. Allin Mfg. Co., Chicago, Ill.
Handy—Blenders. Holsclaw Bros., Inc., Evansville, Ind.
Handy—Ducts and duct fittings. Meyer & Bro. Co., F., Peoria, Ill.
Handy Andy—Vise stands. Western Wire Products Co., St. Louis, Mo.
Handy Flux—Solder. Handy & Harman, New York, N. Y.
Hardweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Hartmann—Heaters. Montgomery Bros., San Francisco, Calif.
Hazleton—Pumps, strainers, valves. Barrett, Haentiens & Co., Hazleton, Pa.
Heath-Crete—Refractories. Quigley Co., Inc., New York, N. Y.
Hearth patch—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Heart Oak—Belting. Graton & Knight Co., Worcester, Mass.
Heat-aid—Refractories. Pyrolite Products Co., Cleveland, O.
Heat Cel—Hot gas defrosting systems. Dole Refrigerating Co., Chicago, Ill.
Heatcote—High temperature paint. Debovoise Co., The, Brooklyn, N. Y.
Heat-Crete—Concrete densifiers. Products Planning Co., Pittsburgh Pa.
Heatflex—Cables, heaters. S&C Mfg. Co., Cincinnati, O.
Heat-Hog—Coolers. Heatron, Inc., York, Pa.
Heatmaster—Heaters. Coleman Co., Inc., The, Wichita, Kans.
Heatomat—Boilers. Richmond Radiator Co., New York, N. Y.
Heat-Pak—Boilers, heaters. Aldrich Co., The, Wyoming, Ill.
Heatrim—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Heat-Rite—Registers. Auer Register Co., Cleveland, O.
Heatsaver—Systems. Advance Pump Co., Berkeley, Calif.
Heatsum—Conductors, cable. Roberson Co., L. N., Seattle, Wash.
Heat-Tite—Insulating cement. Ramtite Co., The, Chicago, Ill.
Heat-Valve—Ventilators. Swartwout Co., The, Cleveland, O.
Heat Wagon—Heaters. Lennox Industries, Inc., Marshalltown, Ia.
Heavy Duty Walco—Wrenches. Walworth Co., New York, N. Y.
Heilex—Tanks. Heil Process Equipment Corp., Cleveland, O.
Heliarc—Welders. Research Vacuum Supply Co., Chicago, Ill.
Heliarc—Welders. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Heliflow—Aftercoolers, chillers, oil coolers, heat exchangers, water heaters. Graham Mfg. Co., Inc., New York, N. Y.
Hellite—Refractories. Johns-Manville, New York, N. Y.
Herco—Arc welders. Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Herculoy—Tubing. Revere Copper and Brass, Inc., New York, N. Y.
Herecrol—Protective Coatings, tank linings, lined pipe. Heresite & Chemical Co., Manitowoc, Wis.
Hev-E-Gas—Burners. Cleaver-Brooks Co., Milwaukee, Wis.
Hev-E-Oil—Burners. Cleaver-Brooks Co., Milwaukee, Wis.
Hex-Changer—Heat Exchangers. Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Hex-Tex—Belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Hi-Cap—Furnaces. Syncromatic Corp., Watertown, Wis.
Hidden Heat—Coils and panels. Hi-Flow Products, Inc., Copiague, N. Y.
Hideaway—Air conditioning units. Burnham Corp., Irvington, N. Y.
Hideway—Cooling towers. Toungate & Coats, Austin, Tex.
Hi-Duty—Tubing cutters, fittings, shafts, flaring tools. Imperial Brass Mfg. Co., Chicago.
Hi-Duty—Combustion chambers. Monogram Products Co., Inc., Philadelphia, Pa.
Hi-Ef—Filters, heads, separators. Anderson Co., V. D., The, Cleveland, O.
Hi-Ex—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.
Hi-Fin—Surfaces, tubing. Doyle & Roth Mfg. Co. Inc., Brooklyn, N. Y.
Highflex—Belting. Goodrich Co., B. F., Akron, O.
High Heat Aluminum—Paint. Valdura Div., American-Marietta Co., Chicago, Ill.
High Heat Gray—Paint. Valdura Div., American-Marietta Co., Chicago, Ill.
High - Ten - 500—Solder. Industrial Service Laboratories, Milwaukee, Wis.
High Test—Water heaters. Burnham Corp., Irvington, N. Y.
Hi-Heat—High temperature paint. Claronex Products, Inc., Brooklyn, N. Y.
Hilger—Chillers, unit coolers, unit air conditioners, valves. XL Refrigerating Co., Inc., Chicago, Ill.
Hi-Lift—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Hi-Lo—Alarms. Yarnall-Waring Co., Philadelphia, Pa.
Hi-Lo—Pumps. Yeomans Bros. Co., Melrose Park, Ill.
Hi-Lo-Graph—Recorders. Yarnall-Waring Co., Philadelphia, Pa.
Hi-Peak—Water chillers. Acme Industries, Inc., Jackson, Mich.
Hirae—Heaters. Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Hi-Seal—Cement and compounds. Greene, Tweed & Co., North Wales, Pa.
Hi-Speed—Welding and cutting apparatus. Dockson Corp., Detroit, Mich.
Hitchings—Boilers. Burnham Corp., Irvington, N. Y.
Hi - Temp—Insulation. Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Hi-Temp—Insulation cement. Zonolite Co., Chicago, Ill.
Hi-Temp—Paint. Illinois Bronze Powder Co., Chicago, Ill.
Hi-Test—Boilers. Kewanee-Ross Corp., Kewanee, Ill.
Hi-Value—Adhesive tape. Johns-Manville, New York, N. Y.
Hoffman—Heaters. Clayton & Lambert Mfg. Co., Louisville, Ky.
Hoffman—Draft controls. Salina Metal Products Co., Salina, Kan.
Holdtite—Solder. American Brass Co., Waterbury, Conn.
Holgun—Drills. Black & Decker Mfg. Co., Towson, Md.
Hollo-Tech—Doors and panels. Technical Ply-Wood Sales, Chicago, Ill.
Holly—Benders. Griffith Equipment Co., Inc., Los Angeles, Calif.
Holt—Strainers, tube cleaners. Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Holtite—Bolts, screws. Continental Screw Co., New Bedford, Mass.
Holtite—Clamps. Yarnall-Waring Co., Philadelphia, Pa.
Honeycomb—Filters. Wilson & Co., Inc., Chicago, Ill.

Horizontal Remotaire—Air conditioning units. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Horton—Tanks. Chicago Bridge & Iron Co., Chicago, Ill.
Hot Shot—Unit coolers. Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Hot Spot—Preheaters. Rempe Co., Chicago.
Hot Spot—Spot welders. Acme Electric Welder Co., Los Angeles, Calif.
Houghto-Clean—Boiler cleaning compounds. Houghton & Co., E. F., Philadelphia, Pa.
Hovalco—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.
Howlers—Alarms. Benjamin Electric Mfg. Co., Des Plaines, Ill.
Hoze-Lok—Fittings, hose. Parker Appliance Co., The, Cleveland, O.
Humiclean—Cleaning compounds, water treatment. Carolina Aniline & Extract Co., Charlotte, N. C.
Humidair—Humidifiers. Skilbeck Mfg. Co., Kenosha, Wis.
Humidigraph—Humidity recorders, indicator-controllers. Bristol Co., Waterbury, Conn.
Humidiguide—Hygrometers. Taylor Instrument Companies, Rochester, N. Y.
Humidomist—Nozzles, humidifiers. Supreme Electric Products Corp., Rochester, N. Y.
Humidostat—Humidistats. Johnson Service Co., Milwaukee, Wis.
Humiduct—Unit air conditioners. Bahnson Co., Winston-Salem, N. C.
Humid - U - Stat—Humidistats, Minneapolis-Honeywell Regulator Co., Minneapolis.
Humistat—Humidistats. American Instrument Co., Inc., Silver Spring, Md.
Humi-Temps—Unit air coolers. Larkin Coils, Atlanta, Ga.
Hum-O-Zone—Room type humidifiers. Daffin Mfg. Co., Lancaster, Pa.
Humphrey—Heaters. General Gas Light Co., Kalamazoo, Mich.
Huron—Baseboard radiation. Farrell Associates, Charles, Valencia, Pa.
Hurricane—Heaters. Zink Co., John, Tulsa, Okla.
HusHeater—Heaters. Sims Pump Valve Co., Hoboken, N. J.
Hydralt—Protective coatings. Flintkote Co., The, New York, N. Y.
Hydramotor—Valves. General Controls Co., Glendale, Calif. and Skokie, Ill.
Hydrecon—Combustion chambers. France Refractories, Co., J. H., Snow Shoe, Pa.
Hydrepair—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Hydro—Recorders. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Hydro-Flo—Heaters, heating systems, circulators, regulators. Bell & Gossett Co., Morton Grove, Ill.
Hydro-Foam—Dust collectors. Mahon Co., R. C., Detroit, Mich.
Hydro-Foil—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Hydroline—Shaft seals. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Hydro-Matic—Connectors. Mechanical Products Corp., Chicago, Ill.
Hydron—Bellows. Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Hydro-Temp—Towers. Santa Fe Tank & Tower Co. of Texas, Garland, Tex.
Hydro-Whirl—Dust collectors, spray booths. Peters-Dalton, Inc., Detroit, Mich.
Hydryer—Dehumidifiers. Pritchard & Co., of California, J. F., Kansas City, Mo.
Hy-Duty—Blades, propeller fan, fans. Schwitzer-Cummins Co., Indianapolis, Ind.
Hygrodial—Indicators and recorders. Abbeon Supply Co., Jamaica, N. Y.
Hyrate—Refractories. Plibrico Co., Chicago, Ill.
Hy-Spar—High temperature paint. Midland Paint & Varnish Co., Cleveland, O.
Hytemp—Insulation. Armstrong Cork Co., Lancaster, Pa.
Hy-Temp—Cement, insulation. Keasbey & Mattison Co., Ambler, Pa.
Hytempite—Cement, refractories. Quigley Co., Inc., New York, N. Y.
Hy-Test—Heaters. Burnham Corp., Irvington, N. Y.
Hy-Test—Water heaters. Smith Co., Inc., H. B., The, Westfield, Mass.
Hy-Vent—Eliminators. Taco Heaters, Inc., Cranston, R. I.

IMO—Pumps. De Laval Steam Turbine Co., Trenton, N. J.
I-R—Ingersoll-Rand, New York, N. Y.
IVCO—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.
Ice-Cel—Refrigeration, accumulators, chillers. Dole Refrigeration Co., Chicago, Ill.
Icy-Flo—Accumulators. McQuay, Inc., Minneapolis, Minn.
Ideal—Blowers. Perfection Grate & Stoker Co., Springfield, Mass.
Ideal—Tools. Boston Machine Works, Co., Lynn, Mass.
Ideal—Traps. Nason Co., Clarkston, Mich.
Idealarc—Welders. The Lincoln Electric Co., Cleveland, O.
IllBronze—Paint. Illinois Bronze Powder Co., Chicago, Ill.
Immersatherm—Thermostats. Mercoid Corp., The, Chicago, Ill.
Imperial—Air conditioning units. International Metal Products Co., Phoenix, Ariz.
Imperial—Heaters. Payne Div. of Carrier Corp., Monrovia, Calif.
Impervo—Insulation. Philip Carey Mfg. Co., Cincinnati, O.
Impregnated—Bases and pads. Celotex Corp., The, Chicago, Ill.
Impulse—Traps. Yarnall-Waring Co., Philadelphia, Pa.
Inco—Electrodes, flanges, pipe fittings, pipe, rod, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.
Inconel—Pipe, fittings, flanges, pipe, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.
Inconel—Tubing. Trent Tube Co., East Troy, Wis.
Indeeco—Heaters, pipe heating systems. Industrial Engineering & Equipment Co., St. Louis, Mo.
Indestructible—Gaskets. New York Belting & Packing Co., Passaic, N. J.
Indoor-Outdoor—Thermostats. White-Rodgers Electric Co., St. Louis, Mo.
Industrial Air—Furnaces, heaters. Inland Heater Corp., Minneapolis, Minn.
IngAclad—Clad sheets. Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill.
In-Hib-Co—Protective coatings. Haering & Co., Inc., D. W., San Antonio, Tex.
Ins-Lite—Insulation. Insulation Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.
Ins-lite—Insulation. Insulite Co., Minneapolis, Minn.
Instant—Heaters, preheaters. Johnson Corp., The, Three Rivers, Mich.
Instant Glo—Combustion chambers. Boston Machine Works Co., Lynn, Mass.
Instant-Hardner—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y., N. Y.
InstOmatic—Couplings. Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Insulag—Insulation. Quigley Co., Inc., New York, N. Y.
Insulation—Protective coatings. Minnesota Mining & Mfg. Co., St. Paul, Minn.
Insulbrix—Refractories. Quigley Co., Inc., New York, N. Y.
Insulfil—Insulation. Refractory & Insulation Corp., New York, N. Y.
Insulkote—Boiler and tank insulation. Johns-Manville, New York, N. Y.
Insul-Pin—Insulation fasteners and welders. Graham Mfg. Corp., Royal Oak, Mich.
Insulseal—Protective coatings. Eagle-Picher Co., Cincinnati, O.
Insulstic—Adhesives. Eagle-Picher Co., Cincinnati, O.
Insutape—Pipe insulation, Union Asbestos & Rubber Co., Chicago, Ill.
Insutube—Insulation. Union Asbestos & Rubber Co., Chicago, Ill.
Integral Jet—Burners. Stout & Sons, David, St. Louis, Mo.
Intensarc—Electrodes. National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
Inter-Matic—Time switches. International Register Co., Chicago, Ill.
International—Liquid level gages. Applied Mechanics Co., Boston, Mass.
Intru-Lok—Fittings. Parker Appliance Co., The, Cleveland, O.
Involute—Spray nozzles. Yarnall-Waring Co., Philadelphia, Pa.
Ionix—Ionization apparatus. Ionaire, Inc., San Francisco, Calif.
Irenew—Valves. Powell Co., Wm., The, Cincinnati, O.
Ironweld—Compounds. Sight Feed Generator Co., West Alexandria, O.
Irv-o-lite—Plastic tubing. Irvington Varnish and Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Isomodes—Bases and pads, vibration isolating. M. B. Mfg. Co., The, New Haven, Conn.
Ivco—Roof ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.

J & C—Burners, fans, furnaces, heaters. Jackson & Church Co., Saginaw, Mich.
J E—Valves, solenoids. Jackes-Evans Mfg. Co., St. Louis, Mo.
J & H Customized—Motors. Jack & Heintz, Inc., Cleveland, O.
J-M—Gaskets, bases and pads, cement, tape. Johns-Manville, New York, N. Y.
J M Ball—Traps. Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
J O Line—Wrenches. J O Mfg. Co., South Gate, Calif.
J-W—Combustible gas alarms, leak detectors, leak testers. Johnson & Williams Inc., Palo Alto, Calif.
Jacobus—Valves. Majot Automatic Machine Co., Inc., East Orange, N. J.
Jal Duct—Pipe. Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Janitrol—Boilers, burners, heaters, furnaces, units. Surface Combustion Corp., Toledo, O.
Ject-O-Valve—Ventilators. Swartwout Co., Cleveland, O.
Jennings—Pumps, ejectors. Nash Engineering Co., South Norwalk, Conn.
Jet-Air—Air conditioning units. Wright Mfg. Co., Phoenix, Ariz.
Jetal—Protective coatings. Alrose Chemical Co., Providence, R. I.
Jetglas—Heaters. Payne Div. of Carrier Corp., Monrovia, Calif.
Jetglas—Heaters. Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
Jet-Hard—Electrodes. The Lincoln Electric Co., Cleveland, O.
Jet Tube—Systems. McQuay, Inc., Minneapolis, Minn.
Jetweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Jiffy Clips—Hangers and supports. Mineral-lac Electric Co., Chicago, Ill.
Jiffy Dampers—Dampers. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Joaz—Stainless steel fittings. J O Mfg. Co., South Gate, Calif.
John Crane—Boiler tube expanders, seals, packing. Crane Packing Co., Chicago, Ill.
Johnsonite—Plastic pipe. Johnson Plastic Corp., Chagrin Falls, O.
Join "O" Seal—Joints, pipe. Heating Equipment Co., Detroit, Mich.
Joint Seal—Cement. Armite Laboratories, Los Angeles, Calif.
Jointite—Insulation. Mundet Cork Corp., North Bergen, N. J.
Jorgensen—Pipe clamps. Adjustable Clamp Co., Chicago, Ill.
Junior—Radiation. Weil-McLain Co., Michigan City, Ind.
JusRite—Ducts and duct fittings, pipe and fittings. Corbman Bros., Inc., Philadelphia, Pa.

K—Fittings. Kuhns Brothers Co., Dayton, O.
KAB Kool—Air conditioning units. Metal Products Engr., Inc., Los Angeles, Calif.
K. A. T.—Compounds and water treatment. American K.A.T. Corp., Garwood, N. J.
KD-2—Cement. Green Fire Brick Co., A. P., Mexico, Mo.
K-Fin—Cooling and heating surface, tubing. Griscom-Russell Co., The, Massillon, O.
K-Louver—Sun reflecting louvers. Kawneer Co., Niles, Mich.
K and M—Controls, strainers, traps, valves. Kieley & Mueller, Inc., Middletown, N. Y.
K-Master—Filters, separators, traps. Kaye & MacDonald, Inc., West Orange, N. J.
KN-EVACO—Cooling towers. Keller-Northrup, Inc., Dallas, Tex.
K-Shield—Boiler and pipe insulation. Robinson Industries, Coleman, Mich.
Kable Kord—Belting. New York Belting & Packing Co., Passaic, N. J.
Kane—Boilers. Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Kaocast—Refractories and refractory cement. Babcock & Wilcox Co., New York, N. Y.
Kaocrete—Refractories and refractory cement. Babcock & Wilcox Co., New York, N. Y.
Kaolite—Refractories and refractory cement. Babcock & Wilcox Co., New York, N. Y.
Kaowool—Refractories and refractory cement. Babcock & Wilcox Co., New York, N. Y.
Kapco—Cement pipe protectors, sheets and board. Keystone Asphalt Products Co., Chicago, Ill.
Karbate—Carbon pipe, heaters, heat exchangers, pumps. National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
Karbonite—Destroyers. Anderson Chemical Co., Inc., Macon, Ga.
Kathabar—Dehumidifiers, unit air conditioners, humidifiers, air washers. Surface Combustion Corp., Toledo, O.
Kaylo—Insulation. Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
Kaylo—Insulation. Owens-Corning Fiberglas Corp., Toledo, O.
Kearsarge—Insulation, gaskets. Johns-Manville, New York, N. Y.
Kek—Compounds, steam and water treatments. Kenite Laboratory, Inc., Madison, N. J.
Keldur—Bases and pads. Hobsite Products Co., Harrison, N. J.
Kelvinator—Dehumidifiers. Ebco Mfg. Co., Columbus, O.
Kemaloid—Water treatment compounds. McMillan Industrial Supplies, C. C., Portland, Ore.
Ken—Combustion chambers. Barclay, Inc., Robert, Chicago, Ill.
Kenbric—Soot destroyers. Kenite Laboratory, Inc., Madison, N. J.

Kennison—Nozzles. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Kentucky—Sheets. Newport Rolling Mill Co., Newport, Ky.

Key Abso-Lute—Cement and compounds. Key Co., East St. Louis, Ill.

Key Graphite—Cement and compounds. Key Co., East St. Louis, Ill.

Key-Hak—Electric saws. Producers & Distributors, Inc., Allentown, Pa.

KeyKast—Pipe fittings & flanges. Key Co., East St. Louis, Ill.

Keystone—Packaged steam boiler units. Erie City Iron Wks., Erie, Pa.

Keystone—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.

Key-Tite—Cement and compounds. Key Co., East St. Louis, Ill.

Kidskin—Packing. Darcoid Co., Inc., New York, N. Y.

Kil-Mos—Water treatment. Chemical Engineering Co., Dallas, Tex.

Kindorf—Bolts, hangers and supports, inserts, racks. Steel City Electric Co., Pittsburgh, Pa.

Kinetic—Gas burners. Webster Engineering Co., Tulsa, Okla.

King—Gages. Oil Equipment Mfg. Corp., New Haven, Conn.

King-clip—Valves. Lunkenheimer Co., Cincinnati, O.

King Kool—Fans, propeller. Belco Industries, Inc., St. Louis, Mo.

Kleen Air—Filters. Kaye & MacDonald, Inc., West Orange, N. J.

Kleenflo—Unit air filters. Air Maze Corp., Cleveland, O.

Kleen Tube—Heaters. Vapor Heating Corp., Chicago, Ill.

Kleervo—Protectors. Wright-Austin Co., Detroit, Mich.

Klero—Packing. Greene, Tweed & Co., North Wales, Pa.

Kling Felt—Gaskets, tape. Products Research Co., Los Angeles, Calif.

Klingtite—Belting. Goodyear Tire & Rubber Co., Akron, O.

Klixon—Regulators, relays, thermostats. Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.

Klondike—Arc welders. Fern, Ralph, Scranton, Pa.

Klosd-Tite—Motors. Sterling Electric Motors, Inc., Los Angeles, Calif.

Knight-Ware—Pipe, prefabricated ducts, valves, ventilators. Knight, Maurice A., Akron, O.

Knock-Out—Arc welders, torches. Lee Co., K. O., Aberdeen, S. D.

Kno-Draft—Air diffusers. Connor Engineering Corp., New York, N. Y.

Kold Board—Insulation. Baldwin-Hill Co., Trenton, N. J.

Kold Wave—Condensers. Heat Exchangers, Inc., Chicago, Ill.

Kontrol Master—Air valves. Kieley & Mueller, Inc., Middletown, N. Y.

Kontrol Motor—Diaphragm valves. Kieley & Mueller, Inc., North Bergen, N. J.

Kooler-Aire—Condensers. United States Air Conditioning Corp., Minneapolis, Minn.

Kool-Shade—Solar heat resisting screens. Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.

Kool-Temp—Air conditioning units. Midwest Air Conditioning Co., Des Moines, Ia.

Kopr-Kote—Cement and compounds. Jet-Lube, Inc., Burbank, Calif.

Korda—Gaskets. Chicago Gasket Co., Chicago, Ill.

Korduct—Conduit. Johns-Manville, New York, N. Y.

Korector—Draft controls. Cole-Sewell Engineering Co., St. Paul, Minn.

Korner-King—Tools. R C S Tool Corp., Joliet, Ill.

Korolac—Protective coatings. Goodrich Co., B. F., Akron, O.

Koroseal—Plastic pipe fittings, tubing, valves, and protective coatings. Goodrich Co., B. F., Akron, O.

Korth—Boilers. Eckhart Mfg. Co., Inc., Union, N. J.

Krene—Sheets. Bakelite Co., Div. of Union Carbide & Chemical Co., New York, N. Y.

Kromatrol—Colorimeters. Will Corp., Rochester, N. Y.

Krome Kote—Coatings. Wolte-Kote Co., Inc., Sheboygan, Wis.

Kromik—Coatings. Sherwin-Williams Co., The, Cleveland, O.

Kromover—Compounds. All-State Welding Alloys Co., Inc., White Plains, N. Y.

Kuchler-Huhn—Shaft seals. Koppers Co., Inc., Metals Products Div., Baltimore, Md.

Kulene 131—Refrigerants. American Potash & Chemicals Corp., Aerosol & Refrigeration Div., Los Angeles, Calif.

Kwikflux-Solder. Special Chemicals Corp., Ossining, N. Y.

Kwik-way—Regulators. Hart & Cooley Mfg. Co., Holland, Mich.

Kwik-Steam—Boilers. Littleford Bros., Inc., Cincinnati, O.

Kyram—Refractories and refractory cement. Quigley Co., Inc., New York, N. Y.

L. A.—Motors. The Louis Allis Co., Milwaukee, Wis.

L & H—Heaters. Thermador Electrical Mfg., Los Angeles, Calif.

L & N—Indicators. Leeds & Northrup Co., Philadelphia, Pa.

La-Co—Solder and fluxes. Lake Chemical Co., Chicago, Ill.

Lagfas—Adhesives. Foster Co., Benjamin, Philadelphia, Pa.

Lamneck—Ducts and duct fittings. Clayton & Lambert Mfg. Co., Louisville, Ky.

LaMont—High temperature water boilers. International Boiler Works Co., The, East Stroudsburg, Pa.

Lasco—Insulation. Lynch Asbestos Co., Los Angeles, Calif.

Lawson—Wrenches. Fairmount Tool & Forging, Cleveland, O.

L-Blow—Fans, ventilators. Trade-Wind Motor fans, Inc., Rivera, Calif.

Leader—Stocks and dies. Oster Mfg. Co., Cleveland, O.

Leader—Unit air conditioning. Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.

Leader—Water heaters. Day & Night Div., Affiliated Gas Equip., Inc., Monrovia, Calif.

Leadtex—Sheets. Revere Copper & Brass, Inc., New York, N. Y.

Leaflex—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.

Leak Lock—Cement and compounds. Highside Chemicals Co., A Unit of Stewart Industries, Inc., Clifton, N. J.

Leak-Tec—Leak testers. American Gas & Chemicals, Inc., New York, N. Y.

Lectro-Clad—Protective coatings, fittings, pipe, sheets. Bart Mfg. Inc., Belleville, N. J.

Lectrodryer—Dehumidifiers. Pittsburgh Lectrodryer Corp., Pittsburgh, Pa.

Led-Plate—Cement and compounds. Armite Laboratories, Los Angeles, Calif.

Ledaloyl—Sleeve bearings. Johnson Bronze Co., New Castle, Pa.

Leigh—Roof ventilators. Air Control Products, Inc., Coopersville, Mich.

Lekro-Tektor—Electrolytic devices. Marlo Coil Co., St. Louis, Mo.

Len-Lox—Ducts and Duct Fittings. Lennox Industries, Inc., Marshalltown, Ia.

Leraydo—Zinc sheets. Illinois Zinc Co., Chicago, Ill.

Levalarm—Alarm. Reliance Gauge Column Co., Cleveland, O.

Levelizer—Gas regulators. Mueller Climatrol, Milwaukee, Wis.

Level-Master—Regulators. Sporlan Valve Co., St. Louis, Mo.

Levelometer—Gages, recorders. Liquidometer Corp., Long Island City, N. Y.

Levelrator—Indicators, alarms, gages, recorders, regulators, switches. Fischer & Porter Co., Hatboro, Pa.

Level-Temp—Thermostats. White-Rodgers Electric Co., St. Louis, Mo.

Level-Trol—Regulators. Fisher Governor Co., Marshalltown, Ia.

Lever-Seald—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.

Liberty—Hose. Continental Rubber Wks., Erie, Pa.

Liberty—Packing. Johns-Manville, New York, N. Y.

Liberty—Ventilators, caps. Penn Ventilating Co., Philadelphia, Pa.

Life Line "A"—Electric motors. Westinghouse Electric Corp., Pittsburgh, Pa.

Lightening Hole—Punches. M-M-A, Inc., Lancaster, Pa.

Lightning—Cleaning compounds. Western Chemical Co., Kansas City, Mo.

Lightweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.

Lima—Stokers. Carnes, Inc., John R., Lima, O.

Limit-Load—Centrifugal fans. Buffalo Forge Co., Buffalo, N. Y.

Limitorque—Valves, valve operators. Philadelphia Gear Works, Inc., Philadelphia, Pa.

Limitrol—Alarms. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

Limpet—Insulation. Keasbey & Mattison Co., Ambler, Pa.

Lincoln—Air conditioning units. Forston Co., Houston, Texas.

Lincwelder—Welders. Lincoln Electric Co., The, Cleveland, O.

Line—Electric motors, speed reducers. Brown-Brockmeyer Co., Inc., Dayton, O.

Lineflow—Fans. American Blower Corp., Detroit, Mich.

Line-o-flo—Air diffusers. Barber-Colman Co., Rockford, Ill.

Link-Grip—Pipe wrenches. American Machine Wks., Inc., Racine, Wis.

Lincolnweld—Arc welders. Lincoln Electric Co., The, Cleveland, O.

Linovector—Heating surface. Vulcan Radiator Co., Hartford, Conn.

Lipco—Cement lined fittings and pipe. Cement Lined Pipe Co., Lynn, Mass.

Liquid Eye—Sight glasses. Allin Mfg. Co., Chicago, Ill.

Liquid wrench—Solvent. Radiator Specialty Co., Charlotte, N. C.

Liquiflux—Welding compounds. Sight Feed Generator Co., West Alexandria, O.

Liqui-Jector—Filters. Selas Corp. of America, Philadelphia, Pa.

Lite-Cast—Combustion chambers. Monogram Products Co., Inc., Philadelphia, Pa.

Lite-Mite—Stands, wrenches. International Forge Co., Chicago, Ill.

Lithcote—Coatings. Lithgow Corp., Chicago.

Lithoform—Protective coatings. American Chemical Paint Co., Ambler, Pa.

Little Beaver Pumps—Johnston Pump Co., Pasadena, Calif.

Little Blacksmith—Punches, shears. Kidder Mfg. Co., Inc., J. F., Burlington, Vt.

Little Giant—Sump pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.

Little Giant—Stock and dies. Greenfield Tap & Die Corp., Greenfield, Mass.

Little Giant—Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.

Little Giant—Unit heaters. John J. Nesbitt, Inc., Philadelphia, Pa.

Little Giant—Pipe crimper tools. Pioneer Tool Company, Racine, Wis.

Livermont—Wrenches, tools. Richmont, Inc., Monrovia, Calif.

Lloyd—Solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.

Lo-Blast—Burners. Mid-Continent Metal Products Co., Chicago, Ill.

Lockaire—Insulation. Plastergon Wall Board Co., Buffalo, N. Y.

Lock-Joint—Ducts. Inland Steel Products Co., Milwaukee, Wis.

Lock-o-Seal—Seals. Wolfe Co., Inc., The Franklin C., Culver City, Calif.

Lockseam—Pipe. Naylor Pipe Co., Chicago.

Lockseam—Tubing. Helical Tube Corp., East Orange, N. J.

Lodestar—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.

Lo-Fin—Surfaces, tubing. Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.

Lo-K—Insulation. Lockport Mills, Inc., Lockport, N. Y.

Lok Joint—Insulation. Insulite Co., Minneapolis, Minn.

Lolag—Heaters. American Instrument Co., Inc., Silver Spring, Md.

Lo-Line—Cooling towers. Pritchard & Co. of California, J. F., Kansas City, Mo.

Long Life—Hose, packing. Goodall Rubber Co., Trenton, N. J.

Longlife—Coating. Flexrock Co., Philadelphia, Pa.

Longrip—Pipe extractors. Ridge Tool Co., Elyria, O.

Lookout Heggie-Simplex—Boilers, heaters. Lookout Boiler & Mfg. Co., Chattanooga.

Lord Burnham—Boilers. Burnham Corp., Boiler Div., Irvington, N. Y.

Lo-Set—Stokers. Canton Stoker Corp., Canton, O.

LoStoker—Stokers. Detroit Stoker Co., Detroit, Mich.

Louvre—Louvers and shutters. Kelvin-White Co., Boston, Mass.

Lo-Veyor—Conveyor. Ajax Flexible Coupling Co., Westfield, N. Y.

Lowcost—Boilers. Murray Iron Works Co., Burlington, Ia.

Lowdensite—Insulation. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis.

Lown—Machines. San Angelo Foundry & Machine Co., San Angelo, Tex.

Low Pressure Drop—Strainers. Zurn Mfg. Co., J. A., Industrial Div., Erie, Pa.

Loxin—Bolts. Star Expansion Bolt Co., New York, N. Y.

Loxit—Fittings. Scovill Mfg. Co., Waterville Div., Waterville, Conn.

Loxite—Pipe covering adhesives. Xylos Rubber Co., Akron, O.

Lucite—Plastics, powder and resins. duPont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del.

Luminite—Boiler cleaning compounds, steam system treatment. Warren Refining & Chemical Co., The, Cleveland, O.

Luncor—Valves. Lunkenheimer Co., Cincinnati, O.

Luxaire—Heaters. Olsen Mfg. Co., C. A., Elyria, O.

Lyonore Metal—Sheets. Lyon, Conklin & Co., Inc., Baltimore, Md.

M.D.—Boilers. Murray Iron Wks. Co., Burlington, Ia.

M.F.—Fans. New York Blower Co., Chicago.

M. E.—Motors. Marathon Electric Mfg. Corp., Wausau, Wis.

M & F—Rubber base enamel. Valdura Div., American-Marietta Co., Chicago, Ill.

M & H—Sheets. Matthiessen & Hegeler Zinc Co., La Salle, Ill.

MIF—Couplings, fittings. Malleable Iron Fittings Co., Branford, Conn.

MKO—Pumps. Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Philadelphia, Pa.

M & M—Alarms, cut-offs, feeders, humidifiers, operators, pumps, regulators, switches, valves. McDonnell & Miller, Inc., Chicago.

M-Pel-Air—Blades, fans. Brookside Products Co., Inc., McCordsville, Ind.

M-R-C—Ball bearings. Marlin-Rockwell Corp., Jamestown, N. Y.

M-Scope—Pipe locators, leak detectors. Fisher Research Laboratory, Inc., Palo Alto, Calif.

M & T—Welders. Metal & Thermit Corp., New York, N. Y.

M-VB—Valves. Scovill Mfg. Co., Waterville Div., Waterville, Conn.

M/W and A/C Airmat—Air filters. American Air Filter Co., Inc., Louisville, Ky.

MW-One—Adhesives, cement. Philip Carey Mfg. Co., Cincinnati, O.

MW-50—Adhesives, cement. Philip Carey Mfg. Co., Cincinnati, O.

Macheta—Fans, fan blades, ventilators. Aerovent Fan Co., Inc., Piqua, O.

Maco—Treated cloth. Menardi & Co., El Segundo, Calif.

Magic—Cement and compounds. Blue Ridge Talc Co., Inc., Henry, Va.

Magic-Aire—Fans, cooling surface, air conditioning units. United Electric Co., Wichita Falls, Tex.

Magic Carpet—Door controls. Stanley Works, The, New Britain, Conn.

Magic Dial—Pre-assembled control systems. Midwest Automatic Control Co., Des Moines, Ia.

Magic Eye—Sight glasses. Imperial Brass Mfg. Co., Chicago, Ill.

Magic Eye Door—Door controls. Stanley Works, The, New Britain, Conn.

Magic Grip—Sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Magic Pivot—Electric saws. Oster Mfg. Co., John, Milwaukee, Wis.

Magic Wire—Control systems wire. Midwest Automatic Control Co., Des Moines, Ia.

Magnaflow—Pumps. The Corley Co., Jersey City, N. J.

Magnefer—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.

Magnehelic—Portable analyzers. Dwyer Mfg. Co., F. W., Michigan City, Ind.

Magnetrol—Alarms, boiler cut-offs, switches. Schaub Engineering Co., Fred H., Chicago.

Magnex—Scale removal. Magnus Chemical Co., Garwood, N. J.

Magnilastic—Pipe joints. Cook Electric Co., Chicago, Ill.

Mainliner—Fan blades and fans. Burden Co., Alan E., Los Angeles, Calif.

Make & Break—Valves. Dole Refrigerating Co., Chicago, Ill.

Make-up Air—Air conditioning units. New York Blower Co., Chicago, Ill.

Malgate—Valves. Powell Co., Wm., The Cincinnati, O.

Malrenew—Valves. Powell Co., Wm., The, Cincinnati, O.

Manco—Plastic pipe. Manufacturers Corp., Mansfield, O.

Manganend—Electrodes. Arcos Corp., Philadelphia, Pa.

Manganweld—Electrodes. Lincoln Electric Co., Cleveland, O.

Manhattan—Packing. Greene, Tweed & Co., North Wales, Pa.

Manu-Rod—Pipe cleaning machines. Spartan Tool Co., Chicago, Ill.

Mar-Flex—Joints. Marquette Coppersmithing Co., Philadelphia, Pa.

Mark Time—Time switches. Rhodes, Inc., M. H., Hartford, Conn.

Mars—Pumps. Solar Aircraft Co., San Diego, Calif.

Marvair—Air conditioning units. Muncie Gear Works, Muncie, Ind.

Marvel—Heaters. Bastian-Morley Co., Inc., La Porte, Ind.

Marvellaire—Air conditioning units. Meyer Furnace Co., The, Peoria, Ill.

Marvelous—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.

Marvelwite—Enamels and lacquers. Sonneborn Sons, Inc., L., New York, N. Y.

Masco—Combustion chambers. Munn & Steele, Inc., South Boston, Mass.

Mascote—Insulation. Munn & Steele, Inc., South Boston, Mass.

Massachusetts—Fans, unit heaters, blower wheels, air washers, housings, ventilators. Bishop & Babcock Mfg. Co., Cleveland, O.

Master—Fittings. Mel Products Co., The, New Haven, Conn.

Master—Stokers. Muncie Gear Wks., Inc., Muncie, Ind.

Master—Unions. Jefferson Union Co., Inc., New York, N. Y.

Master—Water heaters. Kehm Corp., The, Chicago, Ill.

Master-Bilt—Pumps. Schaub Engineering Co., Fred H., Chicago, Ill.

Master Kraft—Air heaters. Harvey-Whipple, Inc., Springfield, Mass.

Master Pilot—Valves. Powell Co., Wm., The, Cincinnati, O.

Mastic—Coatings. Poe Co., C. W., The, Cleveland, O.

Maxaw—Electric saws. Oster Mfg. Co., John, Milwaukee, Wis.

Maxdrill—Drills. Oster Mfg. Co., John, Milwaukee, Wis.

Maximon—Gages. J. E. Longergan Co., Philadelphia, Pa.

Maxsteam—Boilers. Martin Co., Inc., J. O., San Francisco, Calif.

McDaniel—Floats, traps. Watson & McDaniel Co., Philadelphia, Pa.

McGregor—Glasses. Chesterton Co., A. W., Everett, Mass.

Measurrench—Wrenches. Williams & Co., J. H., Buffalo, N. Y.

Mechanipak—Seals. Garlock Packing Co., Palmyra, N. Y.

Meco—Torches, compounds, gages, regulators, valves, welding rod. Modern Engineering Co., St. Louis, Mo.

Medrac—Conductors and panels, heaters. Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.

Meletron—Switches. Barksdale Valves, Los Angeles, Calif.

Mercury—Pipe cutting machines. Obear & Son, W. F., Inglewood, Calif.

Mercury actuated—Recorders. Palmer Thermometers Inc., Cincinnati (Norwood), O.

Merrill Process—Heating systems. Parks-Cramer Co., Fitchburg, Mass.

Metagraphic—Transmitters. Bristol Co., The, Waterbury, Conn.

Metakote—Enamels and lacquers. Tropical Paint Co., Cleveland, O.

Metalbestos—Caps, pipe and fittings. Wallace Co., William, Metalbestos Div., Belmont, Calif.

Metal-Master—Shears. Wiss & Sons Co., J., Newark, N. J.

Metalflo—Tubes and tubing. H & H Tube & Mfg. Co., Detroit, Mich.

Metalhide—Protective coatings. Pittsburgh Plate Glass Co., Pittsburgh, Pa.

Metalite—Enamels and lacquers. Atlas Powder Co., North Chicago, Ill.

Metalprep—Compounds. Nielson Chemical Co., Detroit, Mich.

Metameter—Transmitters. Bristol Co., The Waterbury, Conn.

Metaphram—Valves. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Metco—Ducts and duct fittings. Sheet Metal Mfg. Co., Inc., Brooklyn, N. Y.

Meteor—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.

Metermax—Thermometers. Leeds & Northrup Co., Philadelphia, Pa.

Met-L-Flex—Bases and pads. Robinson Aviation, Inc., Vibrashock Div., Teterboro, N. J.

Met-L-Tex—Protective coatings. France Refractories Co., J. H., Snow Shoe, Pa.

Metl-Tech—Doors and panels, metal sheets. Technical Ply-Wood Sales, Chicago, Ill.

Metrotherm—Thermostats. General Controls Co., Glendale, Calif.

Miami—Fans. Philip Carey Mfg. Co., Cincinnati, O.

Micahl—Insulation. Munn and Steele, Inc., South Boston, Mass.

Micro—Low water cut-offs. Maid-O'-Mist, Inc., Chicago, Ill.

Micro-Feed—Humidifiers. Cleveland Humidifier Co., Cleveland, O.

Proportioneers, Inc., Div. of B-I-F Industries, Inc. Providence, R. I.

Micro-filters—Filters. Selas Corp. of America, Philadelphia, Pa.

Microflex—Bases and pads. L.O.F. Glass Fibers Co., Toledo, O.

Micro-Klean—Filters, strainers. Cuno Engineering Corp., Meriden, Conn.

Microlite—Insulation, wrap pipe. L.O.F. Glass Fibers Co., Toledo, O.

Micromax—Recorders, indicator and recorder-controllers, thermometers. Leeds & Northrup Co., Philadelphia, Pa.

Micromet—Water treatment. Calgon Inc., Pittsburgh, Pa.

Micro Motors—Motors. Redmond Co., Inc., Owosso, Mich.

Micro-Netic—Feeders. Campbell Co., J. A., Long Beach, Calif.

MicroRold—Sheets. Washington Steel Corp., Washington, Pa.

Microtherm—Thermostats. Barber-Colman Co., Rockford, Ill.

Microvac—Pumps. Stokes Machine Co., F. J., Philadelphia, Pa.

Micro-Weld—Spot welders. Micro Products Co., Chicago, Ill.

Midget—Radiation. Utica Radiator Corp., Utica, N. Y.

Midget Powerhouse—Unit heaters. Century Engineering Corp., Cedar Rapids, Ia.

Midget Waterboy—Float valves. Maid-O'-Mist, Inc., Chicago, Ill.

Midwest—Pumps. Tech-Tron Corp., Lawrence, Kans.

Mighty Midget—Drills. Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.

Mighty Mite—Thermostats. Mechanical Industries Production Co., Akron, O.

Milcor—Angles, ducts, doors and panels, hangers and supports. Inland Steel Products Co., Milwaukee, Wis.

Milex—Plastic pipe fittings. Tenco, Inc., Winona, Minn.

Milford—Tools. Thompson & Son Co., The, Henry G., New Haven, Conn.

Mills—Boilers. Smith Co., Inc., H. B., The, Westfield, Mass.

Milvaco—Air eliminators, floats, strainers, traps, valves. Milwaukee Valve Co., Milwaukee, Wis.

Mindicator—Gages. Dickson Co., The, Chicago, Ill.

Minicordes—Recorders. Dickson Co., The, Chicago, Ill.

Mipco—Valves. Associated Valve & Engineering Co., Chicago, Ill.

Miracle—Adhesives, fasteners. Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.

Miracle Red—Coatings. Debovoise Co., The, Brooklyn, N. Y.

Miracool—Air conditioning units. Payne Div. of Carrier Corp., Monrovia, Calif.

Mirrolac—Enamels and lacquers. Devoe & Reynolds Co., Inc., New York, N. Y.

Mixend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.

MKAYO—Boilers. Mears-Kane-Ofeldt Inc., Div. S. T. Johnson Co., Philadelphia, Pa.

Mobilene—Gaskets. Johns-Manville, New York, N. Y.

Model-F—Wrenches. Richmont, Inc., Monrovia, Calif.

Model Star—Valves. Powell Co., Wm., The, Cincinnati, O.

Moderator—Heating System. Webster Co., Warren, Camden, N. J.

ModernAire—Fans, unit air conditioners. National Gas Equipment Co., Inc., Denison, Tex.

Modu-Aire—Air conditioning units. United States Air Conditioning Corp., Minneapolis.

Moduflow—Control systems. Minneapolis-Honeywell Regulator Co., Minneapolis.

Modulatic—Boilers. Vapor Heating Corp., Chicago, Ill.

Modustat—Valves. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Modutrol—Heating systems, valve and duct operators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Modutron—Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Mogul—Packing. Johns-Manville, New York.

Mogul—Boiler cleaning compounds, soot destroyers and water treatment. North American Mogul Products Co., The, Cleveland, O.

Moisture Magnet—Dehumidifiers. Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.

Moldisc—Grinders and grinding wheels. Raybestos-Manhattan, Inc., Passaic, N. J.

Moncrief—Ducts and duct fittings, heaters, tin pipe, air conditioning units. Henry Furnace Co., The, Medina, O.

Monel—Pipe fittings, flanges, pipe, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.

Monend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.

Monmouth—Humidifiers, valves. Cleveland Humidifier Co., Cleveland, O.

Mono-Block—Insulation. Baldwin-Hill Co., Trenton, N. J.

Monobolt—Chillers, oil coolers, water heaters. Graham Mfg. Co., Inc., New York, N. Y.

Mono-Cast—Pipe. American Cast Iron Pipe Co., Birmingham, Ala.

Monocast—Refractories and refractory cement. Ramtite Co., The, Chicago, Ill.

Monoflo—Hot water heating systems and fittings. Bell & Gossett Co., Morton Grove, Ill.

Monofold—Manifolds and headers. Dahl, G. W., Bristol, R. I.

Monogram—Combustion chambers. Grant Wilson, Inc., Chicago, Ill.

Mono-Line—Refractories. Quigley Co., Inc., New York, N. Y.

Monoloct—Heat exchangers. Graham Mfg. Co., Inc., New York, N. Y.

Mono Motors—Motors. Redmond Co., Inc., Owosso, Mich.

Mono-Peen—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.

Monotube—Link-Belt Co., Chicago, Ill.

Monovent—Ventilators. Burt Mfg. Co., Akron.

Monoweld—Electrodes, arc welding. All-State Welding Alloys Co., Inc., White Plains, N. Y.

Monoxivent—Fittings. Kent-Moore Organization, Inc., Detroit, Mich.

Monsoon—Fans, grilles, louvers. Jamieson Mfg. Co., Dallas, Texas.

Morflex—Flexible couplings. Morse Chain Co., Ithaca, N. Y.

Morgrip—V belts. Maurey Mfg. Corp., Chicago, Ill.

Mor-Heat—Treatment to inhibit corrosion, compounds. Moreheat Distribution, Inc., Cincinnati, O.

Morlex—Steam system treatment. Carbide &

Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York.
Mortite—Gaskets. Mortell Co., J. W., Kankakee, Ill.
Moto-Merco—Relays. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
MotoReducer—Speed reducers. Philadelphia Gear Works, Inc., Philadelphia, Pa.
Motorstoker—Stokers. Hershey Motorstoker, Inc., Manheim, Pa.
Motosteel—Valves. Taylor Instrument Companies, Rochester, N. Y.
Mototrol—Indicator-controllers. Automatic Control Co., St. Paul, Minn.
Mototurb—Ventilators. Uno Ventilator Co., Malden, Mass.
Mouat—Compounds, eliminators, traps. Squires Co., C. E., The, Cleveland, O.
Muckle Vent—Ventilators. Muckle Mfg. Co., Owatonna, Minn.
Muffletone—Insulation. Celotex Corp., The, Chicago, Ill.
Multalarm—Alarms. Automatic Control Co., St. Paul, Minn.
Mult-Au-Matic—Threading and boring machines. Bullard Co., The, Bridgeport, Conn.
Multiblade—Welding fume exhausters. General Blower Co., Morton Grove, Ill.
Multiclone—Dust collectors. Western Precipitation Corp., Los Angeles, Calif.
Multi Duty—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Multi-duty—Pulleys and sheaves. Gates Rubber Co., The, Denver, Colo.
Multi-Flex—Ducts and duct fittings. United States Rubber Co., New York, N. Y.
Multi Mount—Speed reducers. Sterling Electric Motors, Inc., Los Angeles, Calif.
Multiplane—Vibration isolating bases. Lord Mfg. Co., Erie, Pa.
Multiple Retort Stoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Multi-Seal—Bolts, repair plugs. Kenney Co., L. C., Chicago, Ill.
Multitherm—Air conditioning units. Clarage Fan Co., Kalamazoo, Mich.
Multi-Tip—Gas burners. Dalzen Mfg. Co., St. Clair, Mich.
Multi V—V-belts. Goodrich Co., B. F., Akron.
Multivane—Fans, blowers. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Multi-V-Drive—Drives. Worthington Corp., Harrison, N. J.
Multi-Vent—Diffusers, air diffusion panels. Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Multi-Wash—Dust collectors, washers. Schneible Co., Claude B., Detroit, Mich.
Murex—Welding electrodes. Metal & Thermit Corp., New York, N. Y.

NCG—Leak detectors, solder, oxygen systems, welding positioners, torches, welding rod. National Cylinder Gas Co., Chicago, Ill.
N-M-D—Valves. Lunkenheimer Co., Cincinnati, O.
NYB—Heating surface, fans, unit heaters. New York Blower Co., Chicago, Ill.
Nail-A-Matic—Tools. Matrix Engineering Corp., Minneapolis, Minn.
Nalco—Solder. National Lead Co., New York.
Nalco—Water treatment, soot destroyers. National Aluminate Corp., Chicago, Ill.
National—Ground anodes. National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National—Cutters. Wachs Co., E. H., The, Chicago, Ill.
National—Fans, furnaces, heaters. MaGirl Foundry & Furnace Co., Bloomington, Ill.
National—Heaters. Mid-Continent Metal Products Co., Chicago, Ill.
National—Pipe, tubes, tubing. National Tube Div., United States Steel Corp., Pittsburgh.
National—Pipe cutters. Wachs Co., E. H., The, Chicago, Ill.
National-Champion—Furnaces, air heaters. National Heater Co., St. Paul, Minn.
Natur Temp—Insulation. Plastergon Wall Board Co., Buffalo, N. Y.
Naturzone—Insulation. Wilson & Co., Inc., Chicago, Ill.
Navalon—Fiber packing. Johns-Manville, New York, N. Y.
N.E. Hite—Units. Barclay, Inc., Robert, Chicago, Ill.
Nelson—Stokers, pumps, air conditioning units, ventilators. Heating Assurance, Inc., Spokane, Wash.
Nelweld—Welders. Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.
Nemo—Insulating cement. Smith & Kanzler Corp., Linden, N. J.
Neobon—Corrosion shields for pipe joints. Atlas Mineral Products Co., Mertztown, Pa.
Neo Coat—Coatings. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Nerva-Kote—Protective coatings. Rubber and Plastics Compound Co., New York, N. Y.
Nerva-Plast—Protective coatings. Rubber and Plastics Compound Co., New York, N. Y.
Nervatape—Industrial tape. Rubber & Plastics Compound Co., New York, N. Y.
Nev-A-Rust—Protective coatings. The Glidden Co., Cleveland, O.
New Cyclone—Dust collectors. Kirk & Blum Mfg. Co., Cincinnati, O.
New Multifin—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
New Port—Pumps. Everite Pump & Mfg. Corp., Lancaster, Pa.
Niagara—Meters. Buffalo Meter Co., Buffalo.
Nibco—Fittings, flanges, joints, valves. Northern Indiana Brass Co., Elkhart, Ind.
Nibcoloy—Fittings, pipe, stainless steel. Northern Indiana Brass Co., Elkhart, Ind.
Nib-Shear—Power shears. H. A. Mfg. Co., York, Pa.
Nickelend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nickel-Arc—Electrodes. Alloy Rods Co., York, Pa.
Nickend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nicloy—Pipe, tubes, tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Nicolet—Insulation. Sall Mountain Co., Hamilton, O.
Nicuend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nifer—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
"9000" Arc—Torches. Mid-States Welder Mfg. Co., Chicago, Ill.
No Crush—Hose. Ammerman Co., C. L., Minneapolis, Minn.
No Drip—Insulation, protective coatings. J. W. Mortell Co., Kankakee, Ill.
Nocordal—Pipe coils, refrigerating condensers, and heat exchangers. Heil Process Equipment Corp., Cleveland, O.
No-Flex—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
Non-clog—Sewage ejectors and pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Non-clog—Pipe line strainers. Boylston Steam Specialty Co., Chicago, Ill.
Non-Clogging—Spray nozzles. Link-Belt Co., Chicago, Ill.
Non-Con-Dux—Cement, insulation. Grant Wilson, Inc., Chicago, Ill.
Non-Frost—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Nonisol—Sludge prevention treatment. Alrose Chemical Co., Providence, R. I.
Non-Sweat—Insulation. Keasbey & Mattison Co., Ambler, Pa.
No-Ox-Id—Protective coatings. Dearborn Chemical Co., Chicago, Ill.
No-Ox-Id Warp—Protective Coatings. Dearborn Chemical Co., Chicago, Ill.
Norblo—Dust collectors, fans. Northern Blower Co., Cleveland, O.
Norcoat—Tank linings. Norwood Associated Engineers, Inc., Springfield, Mass.
Nordensson—Burners. Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Nordstrom—Valves. Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
No-Spat—Welding compounds. Midland Paint & Varnish Co., Cleveland, O.
No-Thread—Fittings. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
No-Vent—Pumps and systems, Stout & Sons, David, St. Louis, Mo.
Novoid—Insulation, adhesives, vibration isolating bases. National Cork Co., Englewood, N. J.
Nox-Odor—Odor adsorber. Tamms Industries, Inc., Chicago, Ill.
Nu-Air—Adsorbers. Manning Co., Charles E. Pittsburgh, Pa.
Nu-Air—Fans, window ventilator units, blades, louvers and shutters, radiation. Meier Electric & Machine Co., Inc. Indianapolis, Ind.
Nu-Alpina—Ventilators. Inland Steel Products Co., Milwaukee, Wis.
Nu-Grip—Shears and snips. Wiss and Sons Co., J. Newark, N. J.
Nullmatic—Gages, indicators, meters, recorders. Moore Products Co., The, Philadelphia, Pa.
Nu-Notch—Mushroom ventilators. Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Nu-Wood—Insulation. Wood Conversion Co., St. Paul, Minn.
Nu-Wrap—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Nyavco—Valves, gages. New York Air Valve Corp., Brooklyn, N. Y.
Nylasint—Plastics, powder and resins. Polymer Corp. of Pa., Reading, Pa.
Nylatron—Plastics, powder and resins. Polymer Corp. of Pa., Reading, Pa.

OB—Valves, Ohio Brass Co., Mansfield, O.
OCH—Filters. American Air Filter Co., Louisville, Ky.
O.E.M.—Flue caps, combustion chambers, cement and compounds. Oil Equipment Mfg. Corp., New Haven, Conn.
O&S—Burners. Orr & Sembower, Inc., Reading, Pa.
Oasis—Electric dehumidifiers. Ebco Mfg. Co., Columbus, O.
Octopus—Welding fume exhausters. Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Oil-A-Fire—Burners. Automatic Firing Corp., St. Louis, Mo.
Oilbuster—Boiler cleaning compounds. Cannon Chemical Co., Inc., Cambridge, Mass.
Oil-O-Matic—Oil burners, heaters. Williams Div., Eureka Williams Corp., Div. of Henney Motor Co., Inc., Bloomington, Ill.
Oiltex—Gaskets. Chicago Gasket Co., Chicago, Ill.
Oilway—Oil fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Okay Tred—Leather belting. Houghton & Co., E. F., Philadelphia, Pa.
Ol' Faithful—Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.
Omega—Joints. Marquette Coppersmithing Co., Philadelphia, Pa.
Omniguard—Temperature alarms. Edison, Inc., Thomas A., West Orange, N. J.
One Venturi—Heating systems, fittings. Taco Heaters, Inc., Cranston, R. I.
Oriflex—Valves. Dunham Co., C. A., Chicago.
Oriflo—Flanges. Builders-Providence, Inc., B-I-F Industries, Inc., Providence, R. I.
Ori-Flowrator—Flow measuring orifices. Fischer & Porter Co., Hatboro, Pa.
"O" Rings—Packing. Linear Inc., Philadelphia, Pa.
Oversize—Refrigerant dehydrators. Wabash Corp., Chicago, Ill.
Oxequip—Oxygen systems, pumps, valves. Oxygen Equipment & Service Co., Chicago.
Oxweld—Welding rod, welding and cutting apparatus. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Oxyarc—Welding and cutting apparatus. Arcos Corp., Philadelphia, Pa.
Oxycuttend—Electrodes. Arcos Corp., Philadelphia, Pa.
Oyltite-Stik—Cements and compounds. Lake Chemical Co., Chicago, Ill.
Ozite—Insulation. American Hair & Felt Co., Chicago, Ill.
Ozonators—Ozone apparatus. Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

PA 400—Dehydrant and acid neutralizer. Davison Chemical Co., Div. of W. R. Grace & Co., Baltimore, Md.
P. B. H.—Cocks, protectors, try cocks. Paul B. Huyette Co., Inc., Philadelphia, Pa.
P-D—Fittings. Sullivan Valve & Engineering Co., Butte, Mont.
P-D—Pumps. Peters-Dalton, Inc., Detroit.
PD—Blowers, dust collectors, stacks and chimneys, fans. Prat-Daniel Corp., South Norwalk, Conn.
PD QC—Pipe machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
P.E.T.—Drills and motors. Portable Electric Tools, Inc., Chicago, Ill.
P & H—Blue print machines. Peck & Harvey, Chicago, Ill.
P & H—Welding electrodes, engines, hoists, arc welders. Harnischfeger Corp., Milwaukee, Wis.
P.I.V. Variable Speed Drive—Changer. Link-Belt Co., Chicago, Ill.
PSC—Regulators. Perfecting Service Co., Charlotte, N. C.
Pace-King—Boilers. Burnham Corp., Irvington, N. Y.
Pacemaker—Softeners. Stover Water Softener Co., St. Charles, Ill.
Pacemakers—Coolers. McQuay, Inc., Minneapolis, Minn.
Pacific—Unit Heaters. Palmer Mfg. Corp., Phoenix, Ariz.
Pacific—Furnaces. Rosebraugh Co., W. W., Salem, Ore.
Pacific Coast—Refrigerant dehydrators. Wabash Corp., Chicago, Ill.
Packex—Sewage ejectors. Yeomans Bros. Co., Melrose Park, Ill.
Paco—Turbine pumps. Pacific Pumping Co., Oakland, Calif.
Page Sensor—Alarms. Hogart Engineering Co., Los Angeles, Calif.
Paget—Strainers. Self Cleaning Strainer Co., Oak Lawn, Ill.
PAINTGRIP—Sheets. Armco Steel Corp., Middletown, O.
Paladin—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Palco—Packing. Greene, Tweed & Co., North Wales, Pa.
Palco Wool-Saferized—Insulation. Pacific Lumber Co., The, San Francisco, Calif.
Palmaire—Air conditioning units, furnaces, blower wheels, unit heaters, humidifiers. Palmer Mfg. Corp., Phoenix, Ariz.
Palmetto—Packing, shaft seals. Greene, Tweed & Co., North Wales, Pa.
Palmetto SuperSheat—Gaskets. Greene, Tweed & Co., North Wales, Pa.
Pandux—Thermometer wells. Pacific Transducer Corp., Los Angeles, Calif.

Panelair—Heaters. Payne Div. of Carrier Corp., Monrovia, Calif.

Panelray—Gas fired suspended heaters. Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.

Panel-Tex—Panel and control boards. Norristown Magnesia & Asbestos Co., Norristown, Pa.

Paneitrol—Valves. Taco Heaters, Inc., Cranston, R. I.

Panther—Plastic pipes. Western Plastics Corp., Tacoma, Wash.

Papco—Cutters and tools. Penn Brass & Copper Co., Erie, Pa.

Papoose—Machines. Capewell Mfg. Co., Hartford, Conn.

Par—Air compressors. Lynch Corp., Anderson, Ind.

Paracoil—Coils, condensers, heaters, leak detectors, oil coolers, preheaters, steam traps, water chillers, aftercoolers, heating units, valves, vaporizers. Davis Engineering Corp., Elizabeth, N. J.

Paraline—Motor bases. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Parasol—Spray nozzles. Spraying Systems Co., Bellwood, Ill.

Pathfinder—Belting. Goodyear Tire & Rubber Co., Akron, O.

Peak-Temp—Preheaters, fuel oil. Cleaver-Brooks Co., Milwaukee, Wis.

Pedrifugal—Centrifugal pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Pee Vee Cee—Fittings, hoods. Atlas Mineral Products Co., Mertztown, Pa.

Peerless—Pipe machines. Bignail & Keeler Div., John Ramming Machine Co., St. Louis, Mo.

Peerless—Direct radiation. American Radiator & Standard Sanitary Corp., Pittsburgh.

Pelro—Asbestos packing. Greene, Tweed & Co., North Wales, Pa.

Penflex—Hose, flexible. Penn. Flexible Metallic Tubing Co., Philadelphia, Pa.

Penflex-Weld—Absorbers. Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.

Pennco—Sectional cast iron boilers. Pennsylvania Furnace & Iron Co., Warren, Pa.

Penn Domex—Ventilators. Penn Ventilator Co., Philadelphia, Pa.

Penn-M-Co—Fittings. Penn Mfg. Corp., of Washington, Pa., Washington, Pa.

Pennpaint—Coatings. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

Penn-Power—Ventilators. Penn Ventilating Co., Philadelphia, Pa.

Penn Pullman—Ventilators. Penn Ventilator Co., Philadelphia, Pa.

Penn-Turbine—Ventilators. Penn Ventilating Co., Philadelphia, Pa.

Pennsalt—Cleaning compounds. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

Perfectaire—Dampers, fans, furnaces, heaters, humidifiers, louvers and shutters, air conditioning units. Air Conditioning Engineering Co., Cambridge, Mass.

Perfection—Plates. Beaton & Cadwell Mfg. Co., New Britain, Conn.

Perfecto—Boiler parts, cement. Green Fire Brick Co., Mexico, Mo.

Perfecto—Insulation. Philip Carey Mfg. Co., Cincinnati, O.

Perflex—Hose. Perfecting Service Co., Charlotte, N. C.

Perfusaire—Diffusers, registers. Auer Register Co., Cleveland, O.

Perimaheat—Radiation. Young Radiator Co., Racine, Wis.

Perma-Fan—Condensers. Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.

Permadine—Protective coatings. American Chemical Paint Co., Ambler, Pa.

Perm-Align—Drills. Oster Mfg. Co., John, Milwaukee, Wis.

Permanite—Plastic pipe, and valves. Knight, Maurice A., Akron, O.

Permaseal—Gaskets. Chicago Gasket Co., Chicago, Ill.

Pero-Kote—Coatings. Perolin Co., The, Chicago, Ill.

Pero-Nite—Soot destroyers. Perolin Co., Inc., Chicago, Ill.

Pexto—Brakes, punches, shears, wrenches, machines. Peck, Stow & Wilcox Co., Southington, Conn.

Phenolex Liquid Aluminum—High temperature paint. Claronex Products, Inc., Brooklyn, N. Y.

Philatrol—Changers, feeders. Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.

Phil-O-Feeder—Feeders. Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.

Photoswitch—Switches. Electronics Corp. of America, Cambridge, Mass.

Pic—Malleable unions. Dart Union Co., Providence, R. I.

Pic—Steel unions. Fairbanks Co., The, New York, N. Y.

Pier—Spot welders. Peer, Inc., Benton Harbor, Mich.

Pilostat—Flame failure controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Pilot—Valves. Powell Co., Wm., The, Cincinnati, O.

Pilot Generator—Valves. General Controls Co., Glendale, Calif.

Pioneer—Thermostats. Crown Controls Co., Inc., New Bremen, O.

Pipe Line—Strainers. Anderson Co., V. D., The, Cleveland, O.

Pipeasy—Pipe Cement. Flexrock Co., Philadelphia, Pa.

Pipe Master—Pipe cutting machines. Oster Mfg. Co., Cleveland, O.

Pipemaster—Wrenches, pipe vise stands, pipe cutters and vises. Erie Tool Wks., Erie, Pa.

Pipetite-Stik—Cements and compounds. Lake Chemical Co., Chicago, Ill.

Pistonair—Motors. Joy Mfg. Co., Pittsburgh.

Pitchlign—Roller bearings. Roller Bearing Co., of America, West Trenton, N. J.

Pittsburgh—Unit heaters. Automatic Gas Equipment Co., Pittsburgh, Pa.

Pittsburgh-National—Meters. Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.

Planeweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.

Plasgon—Cement and compounds. Samuel Cabot, Inc., Boston, Mass.

Plaskon—Plastics, powders and resins. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.

Plastic Gasket—Pipe cement. Flexrock Co., Philadelphia, Pa.

Plasticord—Wiring. Chester Cable Corp., Chester, N. Y.

Plasticork—Insulation. Armstrong Cork Co., Lancaster, Pa.

Plasticote—Electric wire. Chester Cable Corp., Chester, N. Y.

Plastograph—Viscosimeters. Brabender Corp., Rochelle Park, N. J.

Plastoid—Furnace cement. Plastic Products Co., Detroit, Mich.

Platecoils—Coils and radiation, superheaters. Tranter Mfg., Inc., Lansing, Mich.

Playford—Stokers. Rosedale Foundry & Machine Co., Pittsburgh, Pa.

Plexiform—Fans. Bayley Blower Co., Milwaukee, Wis.

Plicast—Refractories. Plibrico Co., Chicago, Ill.

Pliogard—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.

Pliotron—Filters. Goodyear Tire & Rubber Co., Akron, Ohio.

Plisulate—Insulating cement and insulation. Plibrico Co., Chicago.

Plumber Krak-Stik—Cement and compounds. Lake Chemical Co., Chicago, Ill.

Plumrite—Pipe. Bridgeport Brass Co., Bridgeport, Conn.

Pluralloy—Electrodes. McKay Co., Pittsburgh, Pa.

Pluto-Blue Asbestos—Packing. North American Asbestos Corp., Chicago, Ill.

Ply-Tech—Plywood sheets and board. Technical Ply-Wood Sales, Chicago, Ill.

Pneumastat—Aftercoolers. Schramm, Inc., West Chester, Pa.

Pneumatractor—Aftercoolers. Schramm, Inc., West Chester, Pa.

Pneum-A-trol—Feeders. Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.

Pneumatronic—Electronic and pneumatic temperature control equipment. Johnson Service Co., Milwaukee, Wis.

Pneu-Pump—Pumps. Yeomans Bros. Co., Melrose Park, Ill.

Poeco—Insulation, coatings. Poe Co., C. W., Cleveland, O.

Polartron—Relays, regulators, switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Poly-Flo—Plastic tubing. Imperial Brass Mfg. Co., Chicago, Ill.

Polymerin—Protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.

Polymeroid—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.

Polyprene—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.

Polytherm—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.

Pony—Pipe clamps. Adjustable Clamp Co., Chicago, Ill.

Poronze—Filters. Wabash Corp., Chicago.

Poro-Stone—Filters. Adams Co., Inc., R. P., Buffalo, N. Y.

Porta-Heet—Heaters. Auburn Burner Co., Auburn, Ind.

Port-A-Pony—Pipe cutting machines. Thread-Ezy Mfg. Co., Corunna, Mich.

Porta Drive—Pipe cutting machines. Muncie Gear Wks., Inc., Muncie, Ind.

Porto-Power—Pipe benders and pipe pushers, pumps, punches. Blackhawk Mfg. Co., Milwaukee, Wis.

Porto Shears—Shears. Black & Decker Mfg. Co., Towson, Md.

Portovent—Hose. Flexaust Co., New York, N. Y.

Posit-Aire—Roof ventilators. Tripar Products, Inc., Royal Oak, Mich.

Positive Arc—Arc welders. Welding Apparatus Co., Chicago, Ill.

Powairsaver—Propeller fans. Pritchard & Co. of California, J. F., Kansas City.

Poweraire—Furnaces. Jackson & Church Co., Saginaw, Mich.

Powerated—Furnaces. Jackson & Church Co., Saginaw, Mich.

Power—Belting. Rhoads & Sons, J. E., Wilmington, Del.

Power Gems—Boilers. Edge Moor Iron Works, Inc., Edge Moor, Del.

Power-Flame—Leak detectors. Justrite Mfg. Co., Chicago, Ill.

Power-Flame—Burners, gas. Siemon Mfg. Co., Grandview, Mo.

Power-Flo—Fans, blowers, housings, ventilators. Brookside Products Co., Inc., Mc Cordsville, Ind.

Power-Flow—Ventilators. DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.

Power House—Sump pumps. Weil Pump Co., Chicago, Ill.

Powermaster—Boilers. Orr & Sembower, Inc., Reading, Pa.

Poweroil—Oil burners. Jackson & Church Co., Saginaw, Mich.

Power-Poise—Electric motors. Brown-Brockmeyer Co., Inc., Dayton, O.

Power vent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.

Prasco & 85% magnesia—Insulation. Pabco Products Inc., San Francisco, Calif.

Pratt & Cady—Valves. R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.

Precipitron—Air cleaners. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

Precision—Nozzles. Benjamin Air Rifle Co., St. Louis, Mo.

Precision Molded—Insulation. Pabco Products Inc., San Francisco, Calif.

Premier—Welding rod. American Steel & Wire Div., United States Steel, Cleveland, O.

Pre-Notch—Ducts and duct fittings. Gray Metal Products, Inc., Rochester, N. Y.

Pressure-Speed—Parts for heating and air conditioning equipment. Refrigeration Devices Co., Nutley, N. J.

Pressuretrol—Regulators, switches. Minneapolis-Honeywell Regulator Co., Minneapolis.

Prestal—Pipe and tube benders. Tal Bender, Inc., Milwaukee, Wis.

Presto-O-Lite—Leak detectors, torches. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.

Presto-Lock—Couplings. Smith Bros. Co., Oak Park, Ill.

Prest-O-Weld—Welding and cutting apparatus. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York.

Princo—Gages, manometers, psychrometers, regulators, relays, thermometers, thermostats. Precision Thermometer and Instrument Co., Philadelphia, Pa.

Propeloflo—Meters. Builders-Providence, Inc., Div. of Builders Iron Foundry, Providence, R. I.

Prop-R-Temp—Air conditioning units. Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.

Protecto—Insulation. Philip Carey Mfg. Co., Cincinnati, O.

Protectoglo—Controls. Minneapolis-Honeywell Regulator Co., Instruments Div., Philadelphia, Pa.

Protectomotor—Air filters, separators. Dollinger Corp., Rochester, N. Y.

Protector—Lamps. M-M-A, Inc., Lancaster, Pa.

Protectorelay—Flame-failure controls, relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Protekinsul—Protective coatings. Miracle Adhesives Corp., New York, N. Y.

Pryzoak—Belting. Graton & Knight Co., Worcester, Mass.

Pul Air—Ventilators. Penn Ventilating Co., Philadelphia, Pa.

Pul-Air Ridge—Ventilators. Penn Ventilator Co., Philadelphia, Pa.

Pulsorb—Gages. Longergan Co., J. E., Philadelphia, Pa.

Pulling—Circulators, pumps. Columbus Steam Pump Works Co., Columbus, O.

Pulverzone—Stokers. American Coal Burner and Wood Stoker Corp., Chicago, Ill.

Purecel—Filters. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Pur-O-Fiers—Filters, separators. Air Conversion Research Corp., Chicago, Ill.

Purox—Welding and cutting apparatus. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.

Pylets—Switches, pilot and signal lights. Pyle-National Co., The, Chicago, Ill.

Pyratherm—Controls. Mercoid Corp., The, Chicago, Ill.

Pyrex—Glass pipe, heat exchangers, gage and sight glasses, valves, coils. Corning Glass Wks., Corning, N. Y.
Pyrofax—Propane gas refrigerant. Carbide and Carbon Chemicals Corp., New York.
Pyroflex—Coatings, lined pipes, tanks, enamels and lacquers. Knight, Maurice A., Akron.
Pyromaster—Regulators. Bristol Co., The Waterbury, Conn.
Pyrotrol—Flame failure controls. Bristol Co., The, Waterbury, Conn.
Pyrovisor—Controls. Bristol Co., The, Waterbury, Conn.

QD—Pulleys and sheaves. Worthington Corp., Harrison, N. J.
Q-Drains, eliminators, separators, circulators and fittings for hot water heating systems, relief valves. Quality Specialty Co., Inc., Camden, N. J.
QSU—Couplings. Dahl, G. W., Bristol, R. I. Rivera, Calif.
QS—Circulators, drains, eliminators, fittings, regulators, valves. Quality Specialty Co., Inc., Camden, N. J.
Q-T—Insulation. Celotex Corp., The, Chicago, Ill.
Q-Chromastic—Refractories. Quigley Co., Inc., New York, N. Y.
Q-Chrome—Refractories. Quigley Co., Inc., New York, N. Y.
Q-Seal-Damit—Boiler sealing compounds. Quigley Co., Inc., New York, N. Y.
Quantrol—Vanes. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Quartzoid—Sprinkler heads. Grinnell Co., Inc., Providence, R. I.
Quick-as-Wink—Valves. C. B. Hunt & Son, Inc., Salem, O.
Quick-Coupler—Valves. Dole Refrigerating Co., Chicago, Ill.
Quik Heter—Conductors and panels. Adam Electric Co., Frank, St. Louis, Mo.
Quik-Label—Identification markers. Brady Co., W. H., Milwaukee, Wis.
Quik-Mask—Gaskets. Brady Co., W. H., Milwaukee, Wis.
Quik-Temp—Steam traps. Schaub Engineering Co., Fred H., Chicago, Ill.
Quikupl—Couplings, Cooper Alloy Corp., Hillside, N. J.

RBC—Roller bearings. Roller Bearing Co. of America, West Trenton, N. J.
RB Integral Fan Bases—Bases. Vibration Mounting, Inc., Elmhurst, L. I., N. Y.
RB Pressure—Pressure blowers. Western Blower Co., Seattle, Wash.
RB Vibration Rails—Bases. Vibration Mounting, Inc., Elmhurst, L. I., N. Y.
R & G—Grilles, registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
RH—Air conditioning units. McQuay, Inc., Minneapolis, Minn.
RH Hanger—Absorbers, hangers. Vibration Mounting, Inc., Elmhurst, Long Island, N. Y.
R. I.—Unions. Rhode Island Fittings Co., Providence, R. I.
R-K—Combustion control systems, regulators, valves. Ruggles-Klingemann Mfg. Co., Boston, Mass.
R & M All-Weather—Motors. Robbins & Myers, Inc., Springfield, O.
R-M—Packing. Raybestos-Manhattan, Inc., Passaic, N. J.
R & M Moyno—Pumps. Robbins & Myers, Inc., Springfield, O.
R-Mir-Dek—Protective coatings. Miracle Adhesives Corp., New York, N. Y.
RP—Air filters. Research Products Corp., Madison, Wis.
R P M—Sheet metal. Robertson Co., H. H., Pittsburgh, Pa.
RTC—Valves. Sullivan Valve & Engineering Co., Butte, Mont.
R-U-F—Fans. Reed Unit Fans, Inc., New Orleans, La.
R-Z-U Junior—Fire tube boilers. Fitzgibbons Boiler Co., Inc., New York, N. Y.
Racon Boilers—Heaters. Radiant Heat & Cooling Corp., Santa Clara, Calif.
Racon Kit—Coils and panels. Radiant Heat & Cooling Corp., Santa Clara, Calif.
Rad Coil—Coils. T & H Engineering Co., Little Ferry, N. J.
Radiafin—Finned tubing, finned surface. Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Radial—Unit coolers. McQuay, Inc., Minneapolis, Minn.
Radiant—Direct radiation. Burnham Corp., Irvington, N. Y.
Radiant Baseboard—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Radiantrim—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Radiantrol—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.
Radi-Aire—Propeller fans. Reynolds Electric Co., River Grove, Ill.
Radi-Ion—Ionization apparatus. Montgomery Bros., San Francisco, Calif.
Radioflow—Valves. Smolensky Valve Co., Inc., Bedford, O.
Radi-Vector—Radiation. Vulcan Radiator Co., Hartford, Conn.
Radolite—Cement, refractories. Pyrolite Products Co., Cleveland, O.
Rador—Thermostats. Vapor Heating Corp., Chicago, Ill.
Rajah—Packing. Johns-Manville, New York, N. Y.
Ramiclase—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Ramset—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Ranarex—Analyzers, indicators, recorders. Permutit Co., New York, N. Y.
Rapid—Oil coolers. Bell & Gossett Co., Morton Grove, Ill.
Rapidayton—Units. Dayton Pump & Mfg. Co., Dayton, O.
Rapiduction—Pipe cutting machines. Oster Mfg. Co., Cleveland, O.
Ratochlor—Steam and water treatments. Fischer & Porter Co., Hatboro, Pa.
Ratogate—Valves. Fischer & Porter Co., Hatboro, Pa.
Ratosight—Alarms, flow switches. Fischer & Porter Co., Hatboro, Pa.
Ratovane—Valves. Fischer & Porter Co., Hatboro, Pa.
Raychronix—Leak dectectors, testing machines. Radioactive Products, Inc., Ferndale, Mich.
Raydiant—Radiation. Weil-McLain Co., Michigan City, Ind.
Rayduct—Pipe. Bethlehem Steel Co., Bethlehem, Pa.
Reading—Fittings, valves. R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Ready-Pack—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Reco—Steam convertors, heat exchangers, headers, heaters, preheaters, tanks, unit coolers. Richmond Engineering Co., Richmond, Va.
Reco—Controllers and starters, motors, propeller fans, switches. Reynolds Electric Co., River Grove, Ill.
Reco—Radi-Aire—Fans. Reynolds Electric Co., Chicago, Ill.
Recold—Refrigerating evaporative condensers, coolers, cooling & heating surface, cooling towers, air conditioning units. Refrigeration Engineering, Inc., Los Angeles, Calif.
Record-O-Stat—Recorder-controllers. Johnson Service Co., Milwaukee, Wis.
Red—Compressors, controllers and starters, heaters, indicators, operators, regulators, switches, thermostats. Cooper Co., Clark, Palmyra, N. J.
Red Cap—Ventilators, Warner Ventilator Co., La Grange, Ind.
Red Devil—Furnace and pipe joint cement. Pecora Paint Co., Philadelphia, Pa.
Red Diamond—Refrigerants. Liquid Carbonic Corp., Chicago, Ill.
Red Flash—Traps. Ellis Drier Co., Chicago, Ill.
Red Head—Tongs. Billings & Spencer Co., Hartford, Conn.
Red Head—Traps. Ellis Drier Co., Chicago, Ill.
Red Head—Valves. Imperial Brass Mfg. Co., Chicago, Ill.
Redi-Bends—Coils. Capitol Mfg. & Supply Co., Columbus, O.
Redi-Return—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
Red Seal—Gaskets. Chicago Gasket Co., Chicago, Ill.
Redi-Vac—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
Redreading-Mercury—Hygrometers, psychrometers, thermometers. Palmer Thermometers, Inc., Cincinnati, O.
Red Socket—Wrenches. Lowell Wrench Co., Worcester, Mass.
Red Top—Humidistats, thermostats. H-B Instrument Co., Philadelphia, Pa.
Red Top—Insulation. United States Gypsum Co., Chicago, Ill.
Red Top—Concrete inserts. Leibfried Mfg. Corp., C. H.; Brooklyn, N. Y.
Reductors—Reducers. Boston Gear Works, Quincy, Mass.
Redycote—Coatings. Southport, Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Reformend—Electrodes. Arcos Corp., Philadelphia, Pa.
Refrigerated Kooler-Aire—Air conditioning units. United States Air Conditioning Corp., Minneapolis, Minn.
Rego—Regulators, valves, welding and cutting apparatus. National Cylinder Gas Co., Chicago, Ill.
ReGalv—Coatings. Rotometals, San Francisco, Calif.
Reiser—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.
Relatrol—Heating systems. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Reliance—Belting, packing. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Reliance—Filters and regulators. American Meter Co., Inc., Philadelphia, Pa.
Remotaire—Air conditioning units. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Remote—Indicators. Yarnall-Waring Co., Philadelphia, Pa.
Remox—Steam treatment. Anderson Chemical Co., Inc., Macon, Ga.
Renewo—Valves. Lunkenheimer Co., Cincinnati, O.
Renu-Glas—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Research—Belting. Graton & Knight Co., Worcester, Mass.
Resiscote—Enamels and lacquers. Reilly Tar & Chemical Corp., Indianapolis, Ind.
Reliance—Leather belting. Chicago Belting Co., Chicago, Ill.
Reps—Extractors. Walton Co., Hartford, Conn.
Resistive—Insulation. Infra Insulation, Inc., New York, N. Y.
Revolute—Blueprint machines. Paragon-Revolute Corp., Rochester, N. Y.
Revolving—Heaters. Wing Mfg. Co., L. J., New York, N. Y.
Revolving—Ventilators. Burt Mfg. Co., Akron, O.
Rex—Chain drives, coal and ash conveyors, couplings, nozzles, bearings, pumps. Chain Belt Co., Milwaukee, Wis.
Rex—Heaters. Cleveland Heaters Co., Cleveland, O.
Rex—Fans, ventilators, wheels. Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Rexarc—Electrodes, positioners and welders. Sight Feed Generator Co., West Alexandria, O.
Rex-Flex—Hose, and tubing. Flexonics Corp., Maywood, Ill.
Rexrust—Protective coatings. Continental Products Co., Euclid, O.
Rex-Tube—Duct connections, duct fittings, hose, and tubing. Flexonics Corp., Maywood, Ill.
Rex-Weld—Hose and tubing. Flexonics Corp., Maywood, Ill.
Rexweld—Electrodes. Crucible Steel Co. of America, Pittsburgh, Pa.
Rezistal—Sheets. Crucible Steel Co. of America, Pittsburgh, Pa.
Rhinamel—Enamels and lacquers. Tropical Paint Co., Cleveland, O.
Rid-All—Adsorbers, odor. Abbeon Supply Co., Jamaica, N. Y.
Ridgevent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Ridgid—Pipe machines, wrenches, cutters, chasers, reamers, vises. Ridge Tool Co., Elyria, O.
Ridgoil—Oil. Ridge Tool Co., Elyria, O.
Rifco—Unions. Rhode Island Fittings Co., Hillsgrove, R. I.
Riflex—Vibration absorbers. United Metal Hose Co., Inc., Long Island City, N. Y.
Rigidon—Pipe. Heil Process Equipment Corp., Cleveland, O.
Rigid-Tex—Metals and sheets. Rigidized Metals Corp., Buffalo, N. Y.
Rihco—Humidifiers. Rhode Island Humidifier & Ventilating Co., Boston, Mass.
Rincontrol—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Ring-Tite—Couplings. Johns-Manville, New York, N. Y.
Rip-pl—Enamels and lacquers. Hilo Varnish Corp., Brooklyn, N. Y.
Ripple-Fin—Cooling and heating surface. McQuay, Inc., Minneapolis, Minn.
Risselt—Air valves, air eliminators. Moreheat Distribution, Inc., Cincinnati, O.
Rite-seat—Steam trap float. Reichert Float & Mfg. Co., Toledo, O.
Robot—Switches, thermostats. Miller-Harris Instrument Co., Milwaukee, Wis.
Robot-Eye—Regulators, smoke alarms. Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Rock—Pipe protectors. Keystone Asphalt Products Co., Chicago, Ill.
Rock cork—Pipe insulation. Johns-Manville, New York, N. Y.
Rocksil—Insulation. North American Asbestos Corp., Chicago, Ill.
Rocop—Heaters. Rome-Turney Radiator Co., Rome, N. Y.
Rod Pak—Electrodes. Marquette Mfg. Co., Inc., Minneapolis, Minn.
Rodpak—Packing. Sims Pump Valve Co., Hoboken, N. J.
Rodpax—Packing. National Engineering Products, Inc., Washington, D. C.
Ro-Fin—Tubing. Rome-Turney Radiator Co., Rome, N. Y.
Ro-Flo—Compressors, pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Rolagrip—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Rol-Air—Tools. Imperial Brass Mfg. Co., Chicago, Ill.

Roll-a-Bend—Pipe benders. Radiant Devices, St. Louis, Mo.
Roll-Bond—Heat exchangers. Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill.
Roll-O-Matic—Filters. American Air Filter Co., Inc., Louisville, Ky.
Rollway—Pumps. Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Roofvane—Ventilators. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Roomaire—Air conditioning units. Young Radiator Co., Racine, Wis.
Roomaster—Units. Ajax Corp. of America, Evansville, Ind.
Ross—Pipe joints. Webster & Co., Warren, Camden, N. J.
Rotameter—Flow meters. Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Rotary Union—Pipe joints. Perfecting Service Co., Charlotte, N. C.
Rotary Valvent—Ventilators. Swartwout Co., The, Cleveland, O.
Roto Blast—Furnaces. Moncrief Furnace Co., Atlanta, Ga.
Roto-Clone—Dust collectors. American Air Filter Co., Inc., Louisville, Ky.
Roto-Cup—Gas and oil burners. Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Rotograte Stoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Rotojet—Spray nozzles. Binks Mfg. Co., Chicago, Ill.
Roto-louvre—Dryers. Link-Belt Co., Chicago.
Rotomet—Solder and fluxes. Rotometals, San Francisco, Calif.
Rotometric—Solder and fluxes. Rotometals, San Francisco, Calif.
Roto-Mold—Packing. Linear Inc., Philadelphia, Pa.
Rotonetic—Gas burners. Webster Engineering Co., Tulsa, Okla.
Roto Stoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Roto Stoker Type C-C—Stokers. Detroit Stoker Co., Detroit, Mich.
Roto-Torq—Tools. Richmont, Inc., Monrovia, Calif.
Roto-trol—Liquid pressure regulators, indicators, and switches. Healy Ruff Co., St. Paul, Minn.
Rotre—Vacuum pumps. Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Royal—Packing. United States Rubber Co., New York, N. Y.
Roxaprene—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Roxite—Pipe. United States Stoneware Co., New York, N. Y.
Roxyn C—Enamels and lacquers, protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.
Royal—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Royal Clipper—Cutters and shears. M-M-A, Inc., Lancaster, Pa.
Royal, The—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Rubalt—Enamels and lacquers, protective coating. Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Rub-R-Lon—Enamels and lacquers. Acorn Paint and Chemical Co., Cleveland, O.
Rubyfluid—Solder. Ruby Chemical Co., Columbus, O.
Rusco—Window panels. Russell Co., F. C., The, Cleveland, O.
Rusco Prime—Windows. Russell Co., F. C., The, Cleveland, O.
Rust Bloc No. 20—Coatings. Turco Products, Inc., Los Angeles, Calif.
Rustbuster—Cleaning compounds. Cannon Chemical Co., Inc., Cambridge, Mass.
Rustgon—Compounds. Turco Products, Inc., Los Angeles, Calif.
Rust Evade—Coatings. Turco Products, Inc., Los Angeles, Calif.
Rust Raider—Compounds. Radiator Specialty Co., Charlotte, N. C.
Rust Veto—Protective Coatings. E. F. Houghton & Co., Philadelphia, Pa.

S-A—Conveyors, feeders. Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
SA—Valves. Lunkenheimer Co., Cincinnati, O.
S. C.—Air heaters, gas burners, recorders. Surface Combustion Corp., Toledo, O.
S.F.E.—Insulation. Standard Fuel Engineering Co., Detroit, Mich.
SH Hanger—Absorbers, hangers. Vibration Mounting, Inc., Elmhurst, Long Island, N. Y.
S I—Analyzers, indicators, recorders and systems. Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
S-N—Air conditioning units, burners, fans, heaters, pumps, stokers. Scott-Newcomb, Inc., St. Louis, Mo.
S O H—Boilers. Titusville Iron Wks., Co., The, Titusville, Pa.
S & P—Burners, governors, preheaters, regulators, strainers, fuel oil units, valves. Staples & Pfeiffer, San Francisco, Calif.
S. R. P.—Protective coatings. Sonneborn Sons, Inc., L., New York, N. Y.
SSS—Belting. Goodall Rubber Co., Trenton, N. J.
Sanbanol—Fuel oil treatment. American Sand-Banum Co., Inc., Freeport, N. Y.
Saco—Speed reducers. Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Safe-Flo—Heaters. Screw Machine Products Co., Portland, Ore.
Safe-T-Aire—Air sterilizing units. Hanovia Chemical & Mfg. Co., Newark, N. J.
Safe Guard—Fuel oil preheaters. Alstrom Corp., New York, N. Y.
Safety—Heaters. Wing Mfg. Co., L. J., New York, N. Y.
Sahara—Dehydrators. Imperial Brass Mfg. Co., Chicago, Ill.
Saint Louis—Stokers. Ormsby-Osterman, Inc., St. Louis, Mo.
Sairset—Cement, refractories and refractory cement. Green Fire Brick Co., Mexico, Mo.
Sal Brick—Solder and fluxes. American Solder & Flux Co., Philadelphia, Pa.
Sal-Mo—Cement, insulation, packing, connections, sheets and board. Sall Mountain Co., Hamilton, O.
Sanidaire—Humidifiers. United States Air Conditioning Corp., Minneapolis, Minn.
Sanimaster—Heaters. Ruud Mfg. Co., Pittsburgh, Pa.
Sanitizer—Treatment. Oakite Products, Inc., New York, N. Y.
Santobrite—Water treatment. Monsanto Chemical Co., St. Louis, Mo.
Santocel—Insulation. Monsanto Chemical Co., Merimac Div., Boston, Mass.
Santolene—Fuel oil treatment. Monsanto Chemical Co., St. Louis, Mo.
Santosite—Water treatment. Monsanto Chemical Co., St. Louis, Mo.
Santrol—Registers. Tuttle & Bailey, Inc., New Britain, Conn.
Sarancote—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.
Satincote—Insulation, building. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.
Saunders—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.
Saunders—Pipe cutters. Erie Tool Works, Erie, Pa.
Saunders—Diaphragm valves. Grinnell Co., Inc., Providence, R. I.
Saunders Patent—Valves. Hills-McCanna Co., Chicago, Ill.
Sav-A-Tank—Fuel oil treatment. Sudbury Laboratory, South Sudbury, Mass.
Saver—Fans. Pritchard & Co. of California, J. F., Kansas City 5, Mo.
Scentinel—Compounds. Amplon Corp., Long Island City, N. Y.
Schmidt—Torches. Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Schwan—Propeller pumps. Haertel Co., Walter, Minneapolis, Minn.
Schwan—Gas burners. Jamieson Mfg. Co., Dallas, Texas.
Scotch—Adhesive tape and pipe wrap. Minnesota Mining & Mfg. Co., St. Paul, Minn.
Scotch-Mund—Boilers. Mund Boilers, Inc., Los Angeles, Calif.
Scottie Jr.—Boilers. Kewanee-Ross Corp., Kewanee, Ill.
Scout—Water heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Screw-Seal—Pipe. Robinson Clay Product Co., Inc., The, Akron, O.
Scroll-Aire—Air heaters. Newcomb-Detroit Co., Detroit, Mich.
Scruin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Scru-peller—Sewage ejectors and pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Sea Lion—Leather belting. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Sea Rings—Asbestos packing. Johns-Manville, New York, N. Y.
Sealastic—Fittings. Chicago Forging and Mfg. Co., Chicago, Ill.
Sealdflow—Cooling tower fan drives. Pritchard & Co. of California, J. F., Kansas City, Mo.
Sealeak—Compounds. Ampion Corp., Long Island City, N. Y.
Sealed Life—V-Belts. Dodge Mfg. Corp., Mishawaka, Ind.
Sealfas—Adhesives. Foster Co., Benjamin, Philadelphia, Pa.
Sealmore—Cement and compounds. Armite Laboratories, Los Angeles, Calif.
Seal-Rite—Cement and compounds. Macksons Co., New York., N. Y.
Seasonmaker—Air conditioning units. McQuay, Inc., Minneapolis, Minn.
Seasonmaster—Units. McQuay, Inc., Minneapolis, Minn.
Seigelite—Gaskets. Johns-Manville, New York.
Seismo-Dampers—Bases. Korfund Co., Inc., Long Island City, N. Y.
Selectric—Electric heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Selectrol—Regulators. Automatic Control Co., St. Paul, Minn.
Sel-Lok—Parts for heating and air conditioning equipment. Standard Pressed Co., Jenkintown, Pa.
Sells—Bearings. Royersford Foundry & Machine Co., Royersford, Pa.
Sensatherm—Thermostats. Mercoid Corp., Chicago, Ill.
Sensitrol—Relays. Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Sentinel—Alarms. Johnson-Williams Inc., Palo Alto, Calif.
Sentry—Valves. McRae Corp., Glendale, Calif.
Sentry—Alarms, and smoke recorders. Edwards, L. V., Rockville Center, N. Y.
Sentry—Draft controls, draft regulators. Krueger Sentry Gauge Co., Green Bay, Wis.
Sep-return—Separators. Wabash Corp., Chicago, Ill.
Sequestrene—Water softeners. Alrose Chemical Co., Providence, R. I.
Serval—Gaskets. Chicago Gasket Co., Chicago, Ill.
Service—Packing. Johns-Manville, New York.
Servicecoat—Enamels and lacquers. Debevoise Co., The, Brooklyn, N. Y.
Sesure—Gages. Yarnall-Waring Co., Philadelphia, Pa.
Sette—Filter. Marquart Mfg. Co., Oakland, Calif.
"77"—Pipe coverings. Eagle-Picher Co., Cincinnati, O.
Severn—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Shafconaire—Unit heaters. Overhead Heaters, Inc., Detroit, Mich.
Shafer—Bearings. Chain Belt Co., Milwaukee, Wis.
Shaft King—Reducers. American Pulley Co., The, Philadelphia, Pa.
Shawco—Bends, headers. Shaw Co., Benjamin F., Wilmington, Del.
Shear-Flex—Bases and pads. Vibration Mounting, Inc., Elmhurst, N. Y.
Shear-Seal—Valves. Barksdale Valves, Los Angeles, Calif.
Shelby—Tubing. National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Shield—Pipe protectors. Keystone Asphalt Products Co., Chicago, Ill.
Shield-Arc—Electrodes, arc welders. Lincoln Electric Co., Cleveland, O.
Shockmounts—Bases and pads. Lord Mfg. Co., Erie, Pa.
Shokstop—Absorbers. Wade Mfg. Co., Elgin, Ill.
Shone—Sewage ejectors. Yeomans Bros. Co., Melrose Park, Ill.
Shop King—Welders. Precision Welder Mfg. Co., Chicago, Ill.
Shopmate—Drills. Portable Electric Tools, Inc., Chicago, Ill.
Shuntflo—Meters. Builders-Providence, Inc., Div. of B-I-F Industries Inc., Providence, R. I.
Shur-Flo—Switches. Hays Mfg. Co., Erie, Pa.
Shur-Grip—Tools. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Shuttle Break—Switches. Adam Electric Co., Frank, St. Louis, Mo.
Shut-O-Vent—Louvers and shutters. Reed Unit-Fans, Inc., New Orleans, La.
Sigma—Air diffusers, perforated panels. Wakefield Co., The, Vermillion, O.
Signico—Pilot and signal lights. Signal Injector Co., Brooklyn, N. Y.
Silastic—Packing. Dow Corning Corp., Midland, Mich.
Silbraz—Fittings. Walworth Co., New York, N. Y.
Silence Service—Noise elimination. Industrial Sound Control, Inc., Hartford, Conn.
Silent-Aire—Fans, propeller. Swift Mfg. Co., Inc., Royal Oak, Mich.
Silent-Auburn—Burners, heaters, air conditioning units. Auburn Burner Co., Auburn, Ind.
Silent-Breeze—Fans, louvers and shutters, units. Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Silent Duct—Connections. Elgen Mfg. Corp., Long Island City, N. Y.
Silent Korth—Burners. Eckhart Mfg. Co., Inc., Union, N. J.
Silentvane—Fans. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Sil-Fos—Solder. Handy & Harman, New York, N. Y.
Silicon-Alkyd—Protective coatings. Watson Standard Co., Pittsburgh, Pa.
Silicone—Protective coatings. Dow Corning Corp., Midland, Mich.
Silimite—Water treatment. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Sillimanite—Refractories and refractory cement. Taylor Sons Co., Charles, Cincinnati.
Sill-Line—Radiation. Nesbitt, Inc., John J., Philadelphia, Pa.

Siloo—Solvents, fuel oil treatment. Petroleum Solvents Corp., New York, N. Y.
Siltube—Solder. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Silver Comet—Coatings. Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Silverlume—Paint. Wilbur & Williams Co., Brighton, Mass.
Silver Steel—Tools. Atkins Saw Div., Borg-Warner Corp., Indianapolis, Ind.
Silver Stream—Spray nozzles. Skinner Irrigation Co., Troy, O.
Silvertop—Eliminators, traps. Anderson Co., V. D., The, Cleveland, O.
SilWeld—Solder. Euctectic Welding Alloys Corp., Flushing, N. Y.
Simplex—Gages. Viking Pump Co., Cedar Falls, Ia.
Simplex—Regulators. Bell & Gossett Co., Morton Grove, Ill.
Simplex—Wrenches. Lowell Wrench Co., Worcester, Mass.
Simsestos—Packing. Sims Pump Valve Co., Hoboken, N. J.
Simsite—Packing. Sims Pump Valve Co., Hoboken, N. J.
Sim-Trol—Controls, combustion regulators. Simplex Mfg. Co., Fond du Lac, Wis.
Sine Switch—Switches. Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Single Flow—Cooling towers. Marley Co., The, Kansas City, Mo.
Sioux—Electric drills. Albertson & Co., Inc., Sioux City, Ia.
Sioux—Drills, grinders and shafts. Anderson & Co., Inc., Sioux City, Iowa.
Sirocco—Blowers, fans. American Blower Corp., Detroit, Mich.
Skelly—Stokers. Combustion Engineering-Inc., New York, N. Y.
Skip Tooth—Dies. Nye Tool Co., Chicago, Ill.
Sky-Blast—Roof fan ventilators. Propellair Div., Robbins & Myers Inc., Springfield, O.
Skymaster—Ventilators. Acme Equipment Co., Muskogee, Okla.
Slender—Direct radiation. Dunkirk Radiator Corp., Dunkirk, N. Y.
Slenderizer—Direct radiation. Burnham Corp., Irvington, N. Y.
Slo-Speed—Reducers. Sterling Electric Motors, Inc., Los Angeles, Calif.
Sludgit—Fuel oil treatment. Anderson Chemical Co., Inc., Macon, Ga.
Sludgout—Fuel oil treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Slugin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Smith Clamp—Pipe repair clamps. Pipeline Development Co., Cleveland, O.
Smith Dolan—Electric preheaters and stress relievers. Electric Arc., Inc., Newark, N. J.
Smith Mills—Boilers. Smith Co., Inc., H. B., Westfield, Mass.
Smithway—Motors. Smith Corp., A. O., Electric Motor Div., Dayton, O.
Smoothcote—Insulation, building. Insulite Div., Minnesota & Ontario Paper Co., Minneapolis, Minn.
Snapin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Snap-Rite—Ducts and duct fittings. Gray Metal Products, Inc., Rochester, N. Y.
Sno-Breze—Air conditioning units, blower wheels. Palmer Mfg. Corp., Phoenix, Ariz.
Snug—Radiation. Weil-McLain Co., Michigan City, Ind.
Sof-Tite—Sheets. Wheeling Corrugating Co., Wheeling, W. Va.
Sof-Tite—Sheets. Wheeling Steel Corp., Wheeling, W. Va.
Softweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Sola-Flex—Bellows, joints. Solar Aircraft Co., San Diego, Calif.
Solar Flame—Burners. National-U.S. Radiator Corp., Johnstown, Pa.
Solar-Flux—Compounds. Solar Aircraft Co., San Diego, Calif.
Solray—Radiation. Weil-McLain Co., Michigan City, Ind.
Sol-vet—Cleaning compounds, water treatment. Anderson-Stolz Corp., Kansas City, Mo.
Solvex—Cleaning compounds. Chemical Solvent Co., Birmingham, Ala.
Solvo-Rust—Solvent. Permatex Co., Inc., Brooklyn, N. Y.
Sonderglass—Glasses. Chesterton Co., A. W., Everett, Mass.
Sonic-Ray—Heaters. Bica Co., Girard, O.
Sonoairduct—Ducts. Sonoco Products Co., Hartsville, S. C.
So-Soft—Softeners. Stover Water Softener Co., St. Charles, Ill.
Soundliner—Insulation. Baldwin-Hill Co., Trenton, N. J.
Sound Metal—Noise elimination. Industrial Sound Control, Inc., Hartford, Conn.
Soundscope—Testers. Marsh Instrument Co., Skokie, Ill.
Sound Stream—Insulation. Industrial Sound Control, Inc., Hartford, Conn.
Sound-Zorbers—Vibration absorbers and pipe. Finn & Co., Inc., T. R., Hawthorne, N. J.
South Wind—Heaters. Stewart-Warner Corp., Heating Div., Indianapolis, Ind.
Sovabead—Dehumidifiers. Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sovereign—Packing. Darcoid Co., Inc., New York, N. Y.
Space Saver—Heaters. Payne Div. of Carrier Corp., Monrovia, Calif.
Spasaver—Cooler units. Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Spartan—Packing, belting. Graton & Knight Co., Worcester, Mass.
Spearhead—Gasket cutters. Zimmerman Packing Co., Cincinnati, O.
Special X—Solder. Industrial Service Laboratories, Milwaukee, Wis.
Speedaire—Reducers. Cleveland Worm & Gear Co., Cleveland, O.
Speed Clamps—Hose clamps. Tinnerman Products, Inc., Cleveland, O.
Speed Clips—Insulation fasteners. Tinnerman Products, Inc., Cleveland, O.
Speed Drills—Drills. Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago, Ill.
Speed Grinders—Grinders. Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago.
Speed Grips—Nuts. Tinnerman Products, Inc., Cleveland, O.
Speedheater—Unit heaters. Westinghouse Electric Corp., Sturtevant Div., Boston.
Speed Nuts—Locknuts. Tinnerman Products, Inc., Cleveland, O.
Speedomax—Indicator and recorder-controllers, recorders, thermometers. Leeds & Northrup Co., Philadelphia, Pa.
Speed Primer—Pumps. Chain Belt Co., Milwaukee, Wis.
Speed-Rex—Protective coatings. Truscon Laboratories, Detroit, Mich.
Speed-Trol—Changers. Sterling Electric Motors, Inc., Los Angeles, Calif.
Speed Variator—Changers. Cleveland Worm and Gear Co., Cleveland, O.
Speedweld—Electrodes. Trindl Products, Ltd., Chicago, Ill.
Speedy—Clamps, cutters, extractors, packing, tools, wrenches. Chicago Specialty Mfg. Co., Chicago, Ill.
Speedy-Marx—Identification markers and nameplates. North Shore Nameplate Inc., Bayside, N. Y.
Spekaluminite—Coatings. Special Chemicals Corp., Ossining, N. Y.
Spekleen—Compounds. Special Chemicals Corp., Ossining, N. Y.
Sphero—Ball type and Blow-off valves. Fairbanks Co., New York, N. Y.
Spinner—Gravity ventilators. Warner Ventilator Co., LaGrange, Ind.
Spinner—Ventilators. Inland Steel Products Co., Milwaukee, Wis.
Spin-seat—Steam trap floats. Reichert Float & Mfg. Co., Toledo, O.
Spintex—Building insulation. Johns-Manville, New York, N. Y.
Spiral Fin—Radiation. Edwards Engineering Corp., Pompton Plains, N. J.
Spiralweld—Nickel plated pipe. Taylor Forge & Pipe Wks., Chicago, Ill.
Spiratube—Ducts and duct fittings, hose, tubing. Flexible Tubing Corp., Guilford, Conn.
Spiraweld—Pipes. Naylor Pipe Co., Chicago.
Spiro—Heaters. Stout & Sons, David, St. Louis, Mo.
Spirodome—Spray nozzles. Fluor Products Co., A Div. of the Fluor Corp., Ltd., Whittier, Calif.
Spirotallic—Gaskets. Johns-Manville, New York, N. Y.
Spirovane—Fans. Western Blower Co., Seattle, Wash.
Spongex—Bases and pads, gaskets, pipe insulation. Sponge Products Co., B. F. Goodrich Co., Shelton, Conn.
Spotaire—Air conditioning units. Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Los Angeles, Calif.
Spraco—Booths, nozzles, separators, strainers, washers. Spray Engineering Co., Somerville, Mass.
Spra-Rite—Nozzles. Binks Mfg. Co., Chicago.
Spray-Acoustic—Insulation. Sprayo Flake Co., Chicago, Ill.
Spray-Mostic—Protective coatings. Eagle-Picher Co., Cincinnati, O.
Spraywheel—Air washers. Mountain States Equipment Co., Denver, Colo.
Spring-Cork—Gaskets, tape. Spring Packing Corp., Chicago, Ill.
Spring-Felt—Bases and pads, gaskets, tape. Spring Packing Corp., Chicago, Ill.
Spring-Flex—Absorbers, bases and pads, hangers, hose, noise elimination for cooling tower. Vibration Mounting, Inc., Elmhurst, N. Y.
Springin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Spring-Kote—Adhesives, cement and compounds, insulation. Spring Packing Corp., Chicago, Ill.
Spring Tape—Gaskets. Spring Packing Corp., Chicago, Ill.
Spun steel—Pulleys, sheaves. Mercury Clutch Div., Canton, O.
Square-Fin—Radiation. Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Square-Heat—Boilers. Kewanee-Ross Corp., Kewanee, Ill.
Stabilflo—Valves. Foxboro Co., Foxboro, Mass.
Stabilizer—Controls. Boston Machine Works Co., Lynn, Mass.
Stack-Head—Dampers. Air Control Products, Inc., Coopersville, Mich.
Stainlend—Electrodes. Arcos Corp., Philadelphia, Pa.
StainRod—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.
StainTrade—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Stainweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Stalostic—Protective coatings. Eagle-Picher Co., Cincinnati, O.
Standard—Ventilators. Burt Mfg. Co., Akron.
Standardaire—High pressure blowers. Read Standard Corp., Blower-Stoker Div., Erie, Pa.
Standforated—Grilles. Standard Stamping & Perforating Co., Chicago, Ill.
Star-O-Zone—Ozone apparatus. Norwood Associated Engineers Inc., Springfield, Mass.
Star-Quality—Nipples. Star Tubular Products Co., Chicago, Ill.
Statick—Ventilators. Hirschman-Pohle Co., Inc., Le Roy, N. Y.
Staxauster—Roof ventilators. Allen Cooler & Ventilator, Inc., Rochester, Mich.
Staynew—Filters, silencers. Dollinger Corp., Rochester, N. Y.
Stazin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Steam-Pak—Steam generator unit, heaters. York-Shipley, Inc., York, Pa.
Steelarc—Electrodes, arc welding. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Steelbestos—Metal sheets. American Steel Band Co., Pittsburgh, Pa.
Steelflex—Couplings. Falk Corp., Milwaukee.
SteelTectic—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Steelweld—Brakes, power shears. Cleveland Crane & Eng. Co., Wickliffe, O.
Steen—Cutters, pipe cleaning machines. Continental Machine Co., Chicago, Ill.
Stemco—Thermostats. Stevens Mfg. Co., Inc., Mansfield, O.
Sterilamp—Lamps. Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.
Steritron—Water treatment. Hanovia Chemical & Mfg. Co., Newark, N. J.
Sterlco—Controls, pumps, strainers, regulators, traps, valves. Sterling, Inc., Milwaukee.
Sterling—Compressors, condensers, valves, pipe coils. Reynolds Mfg. Co., Springfield, Mo.
Ster-O-Zone—Ozone apparatus. Norwood Associated Engineers, Inc., Springfield, Mass.
Stictite—Cement, insulation. Refractory & Insulation Corp., New York, N. Y.
Stillson—Heavy Duty Wrenches. Walworth Co., New York, N. Y.
Stirling—Boilers. Babcock & Wilcox Co., New York, N. Y.
Stok-A-Fire—Stokers. Automatic Firing Corp., St. Louis, Mo.
Stokerelay—Relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Stonewall—Board and sheets. Ruberoid Co., New York, N. Y.
Storm Shade—Windows. Ingersoll Products Div., Borg-Warner Corp., Chicago, Ill.
Straitflo—Strainers. Hays Mfg. Co., Erie, Pa.
Strand—Grinders and grinding wheels. Franklin Balmar Corp., Baltimore, Md.
Streamjet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Streamline—Couplings, cutters, fittings, heat exchangers, manifolds, nipples, pipe, strainers, tubing, unions, valves. Mueller Brass Co., Port Huron, Mich.
Streamlined—Chambers. Green Fire Brick Co., A. P., Mexico, Mo.
Streamliner—Registers. Auer Register Co., Cleveland, O.
Streamliner—Belting. New York Belting & Packing Co., Passaic, N. J.
Stronghold—Belting. Rhoads & Sons, J. E., Wilmington, Del.
Studin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Stud-Pak—Insulation. United States Mineral Wool Co., Stanhope, N. J.
Styrofoam—Insulation. Dow Chemical Co., The, Midland, Mich.
Submersion—Boilers, water heaters. Stout & Sons, David, St. Louis, Mo.
Sudden Depth—Drill. Paine Co., Addison, Ill.
Sullivan—Controls. Cole-Sewell Engineering Co., St. Paul, Minn.
Sunair—Heaters. Mission Appliance Corp., Hawthorne, Calif.
Sunrad—Direct radiation, hangers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunray—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Super—Transformers. Union Electric & Mfg. Co., Jersey City, N. J.
Super Air Screws—Fans. Marathon Electric Mfg. Corp., Wausau, Wis.
Supercutno—Packing. Greene, Tweed & Co., North Wales, Pa.
Superector—Wrenches. Williams & Co., J. H., Buffalo, N. Y.
Superex—Pipe, boiler and tank insulation. Johns-Manville, New York, N. Y.
Super-Felt—Insulation. Johns-Manville, New York, N. Y.
Superfin—Furnaces. American Foundry & Furnace Co., Bloomington, Ill.
Super-Fine—Insulation and wrap, pipe. L-O-F. Glass Fibers Co., Toledo, O.
Super Finish—Insulation. Refractory & Insulation Corp., New York, N. Y.
Super-Flo—Dehydrators, filters. Remco, Inc., Zelienople, Pa.
Superflo—Heaters. Payne Div. of Carrier Corp., Monrovia, Calif.
Superflux—Solder. Paul-Lewis Laboratories, Inc., Milwaukee, Wis.
Superior—Fans. American Foundry & Furnace Co., Bloomington, Ill.
Superior—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Super-Jet—Burners. Downing Steel Products, Dayton, O.
Super Light—Insulation. Philip Carey Mfg. Co., Cincinnati, O.
Superratchet—Ratchet Wrenches. Williams & Co., J. H., Buffalo, N. Y.
Superrench—Tools. Williams & Co., J. H., Buffalo, N. Y.
Super-Saw—Tools. R. C. S. Tool Corp., Joliet, Ill.
Super 7—V belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Super Silvertop—Traps. The V. D. Anderson Co., Cleveland, O.
Super "66"—Insulation. Eagle-Picher Co., Cincinnati, O.
Supersheat—Gaskets. Greene, Tweed & Co., North Wales, Pa.
Super T—Systems. Tork Clock Co., Mount Vernon, N. Y.
Supertemp—Insulation. Eagle-Picher Co., Cincinnati, O.
Supertherm—Heating systems. Ross Engineering Corp., J. O., New York, N. Y.
Super X—Sheets. Olin Mathieson Chemical Corp., Metals Div., New York, N. Y.
Super X—Coatings. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Surefit—Ducts and duct fittings, and tin pipe. Henry Furnace Co., Medina, O.
Sure Return—Condensation return pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Sureweld—Electrodes, welders. National Cylinder Gas Co., Chicago, Ill.
Surfamax—Pipe line filters. Micro Metallic Corp., Glen Cove, N. Y.
Sweatflow—Valves. Quality Specialty Co., Inc., Camden, N. J.
Swish—Cleaning compounds. Montgomery Chemical Co., Jenkintown, Pa.
Sylphon—Steam traps. Webster & Co., Warren, Camden, N. J.
Synchro—Operators, orifices, valves. The Bristol Co., Waterbury, Conn.
Synchro-Flame—Burners. Synchronous Flame, Inc., Walworth, Wis.
Synchrogear—Changers. American Flexible Coupling Co., Erie, Pa.
Synchro-Lectric—Viscosimeters. Brookfield Engineering Laboratories, Inc., Stoughton, Mass.
Synchro-Meter—Meters. Bailey Meter Co., Cleveland, O.
Synchron—Motors. Hansen Mfg. Co., Inc., Princeton, Ind.
Synchrotie—Recorders. Westinghouse Electric Corp., Pittsburgh, Pa.
Syncretizer—Unit ventilators. Nesbitt, Inc., John J., Philadelphia, Pa.
Syncro—Gages, regulators, combustion control systems. Canton Stoker Corp., Canton, O.
Syncrogear—Drives, gear-motors, speed reducers. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Syndolag—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Synrub—Wire. United States Rubber Co., New York, N. Y.
Syphonaire—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.

T. N.—Valves. Imperial Brass Mfg. Co., Chicago, Ill.
T. T.—Smoke guns. Hill, E. Vernon & Co., Lake Geneva, Wis.
"TW"—Unit coolers. McQuay, Inc., Minneapolis, Minn.
TXT—Valves. Texsteam Corp., Houston, Tex.
Tabasco—Water heaters. Kewanee-Ross Corp., Kewanee, Ill.
TAC—Wrenches. Proto Tool Co., Los Angeles, Calif.
Tall Boy—Heaters. Lennox Industries, Inc., Marshalltown, Ia.
Tampin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Tanco—Insulation, duct, sound deadening. Thompson and Co., Oakmont, Pa.
Tank-O-Meter—Gages, indicators. Uehling Instrument Co., Paterson, N. J.
Tanktrol—Regulators, sprinkler systems controls. Automatic Control Co., St. Paul.
Tannate—Belting, packing. Rhoads & Sons, J. E., Wilmington, Del.
Tannate-Rockwood—Belt drives. Rhoads & Sons, J. E., Wilmington, Del.
Tapebinder—Industrial tape. Gerrard & Co., A. J., Melrose Park, Ill.
Taper-Lock—Couplings, V-belt drives, pulleys and sheaves. Dodge Mfg. Corp., Mishawaka, Ind.
Tasil—Furnace cement. Taylor Sons Co., Charles, Cincinnati, O.
Tayco—Furnace and refractory cement, refractories. Taylor Sons Co., Charles, Cincinnati.
Teco-Steel—High temperature paint. Thompson and Co., Oakmont, Pa.
Teel—Pumps, circulators. Dayton Electric Mfg. Co., Chicago, Ill.
Teflon—Gaskets. Chicago Gasket Co., Chicago, Ill.
Teflon—Plastics, powder and resins. duPont deNemours & Co., E. I., Polychemicals Dept., Wilmington, Del.
Teksag Colloid—Boiler cleaning compounds. Agnew & Tomlinson, Long Island City, N. Y.
Tektolog—Recorders. Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Tektor—Switches, alarms. Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Tel-A-Pipe—Identification markers for piping. Western Lithograph Co., Los Angeles, Calif.
Telecator—Gages, recorders and recorder-controllers. Automatic Control Co., St. Paul.
Telecode—Relays. Benjamin Electric Mfg. Co., Des Plaines, Ill.
Telemaster—Relays. Tork Clock Co., Inc., Mt. Vernon, N. Y.
Telescon—Recorders. Automatic Control Co., St. Paul, Minn.
Teletrol—Controllers and starters. Airgard Mfg. Co., Chicago, Ill.
Tellevel—Switches. Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Telsor—Gages. Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Teltru—Anemometers, gages. Hill, E. Vernon & Co., Lake Geneva, Wis.
Temflex—Plastic tubing. Irvington Varnish & Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Tempchek—Insulation. Philip Carey Mfg. Co., Cincinnati, O.
Templok—Insulation. Armstrong Cork Co., Lancaster, Pa.
Tempmaster—Thermostats. Crown Controls Co., Inc., New Bremen, O.
Tempoint—Thermometers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Temp-R-izer—Burners. Laharco Industries, Minneapolis, Minn.
Temproof—Bases and pads. Lord Mfg. Co., Erie, Pa.
Tempscribe—Recorders. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Temptrol—Insulation. Badham Insulation Co., Inc., Birmingham, Ala.
Temtrim—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Tenite-Kralastic—Plastic pipe. Texas Vitrified Pipe Co., Mineral Wells, Tex.
Tensulate—Insulation. Tennessee Products and Chemical Corp., Nashville, Tenn.
Tergitol—Water treatment. Carbide and Carbon Chemicals Co., A Division of Union Carbide and Carbon Corp., New York, N. Y.
Termin-o-Seal—Seals. Wolfe Co., Inc., The, Franklin C., Culver City, Calif.
Testite—Fittings. General Fittings Co., East Greenwich, R. I.
Texdrive—Pulleys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Texiron—Pullys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Texrope—V-belt drives, pulleys, v-belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Texslide—Motor bases. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
TexSteamers—Boilers. Texsteam Corp., Houston, Tex.
Texolite—Tubing. General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass.
Texway—Bases. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
T-Flo—Dehydrators. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
T Flow—Valves. Quality Specialty Co., Inc., Camden, N. J.
Tharco—Cement. The Armstrong Co., Detroit.
Thawzone—Dehydrant and acid neutralizer. Highside Chemicals Co., A Unit of Stewart Industries, Inc., Clifton, N. J.
Thermaflex—Connectors, tubing, ducts and duct fittings, hose. Flexible Tubing Corp., Guilford, Conn.
Therma-Koil—Tubing. Radiant Heat and Cooling Co., Santa Clara, Calif.
Thermalbridge—Thermometers. Thompson Research & Mfg. Co., Davenport, Fla.
Thermalink—Heaters, preheaters. Electro-Therm, Inc., Silver Spring, Md.
Thermal Electric—Preheaters, systems. Fluid Systems, Inc., New Haven, Conn.
Thermalite—High temperature paint. Tropical Paint Co., Cleveland, O.
Thermatrol—Valves. Schnacke, Inc., Evansville, Ind.
Thermatube—Pre-insulated pipe. Flexible Tubing Corp., Guilford, Conn.
Thermek—Tubing, aftercoolers, chillers, coils, condensers, coolers, exchangers. Heatron, Inc., York, Pa.
Thermidaire—Furnaces, heaters. Campbell Heating Co., E. K., Kansas City, Mo.
Thermo—Expansion valves. Alco Valve Co., St. Louis, Mo.
Thermo—Heaters. American Furnace Co., St. Louis, Mo.
Thermobank—Systems. Kramer Trenton Co., Trenton, N. J.
Thermo-Base—Air diffusers. Gerwin Industries, Inc., Michigan City, Ind.
Thermobestos—Pipe, boiler and tank insulation. Johns-Manville, New York, N. Y.
Thermobloc—Heaters. Prat-Daniel Corp., South Norwalk, Conn.
Thermochek—Controls. Bell & Gossett Co., Morton Grove, Ill.
Thermodaire—Furnaces, heaters, air conditioning units. Campbell Co., E. K., Kansas City, Mo.
ThermoDraulic—Regulators. General Controls Co., Glendale, Calif.
Thermodulor—Control systems. Carvell Heat Equipment Co., Los Angeles, Calif.
Thermoflex—Strainers, heating systems, radiator orifices, traps, valves. Cashin Co., W. D., Boston, Mass.
Thermo Grip—Torches. Ideal Industries, Inc., Sycamore, Ill.
Thermoguide—Thermometers. Taylor Instrument Companies, Rochester, N. Y.
Thermo-Humidigraph — Recorder-controllers. Bristol Co., The, Waterbury, Conn.
Thermoil-Granodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Thermolator—Valves. Triplex Heating Specialty Co., Inc., Peru, Ind.
Thermolier—Unit heaters. Grinnell Co., Inc., Providence, R. I.
Thermopane—Windows. Libbey-Owens-Ford Glass Co., Toledo, O.
Thermoseal—Windows. Russell Co., F. C., The, Cleveland, O.
Thermoswitch—Thermostats, regulators. Fenwal, Inc., Ashland, Mass.
Therm-o-tile—Conduit. Porter & Co., Inc., H. W., Newark, N. J.
ThermoTrade—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Therm-otrols—Thermometers. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Thermovent—Unit ventilators. Nesbitt, Inc., John J., Philadelphia, Pa.
Thermwire—Cables, conductors and Panels. Wiegand Co., Edwin L., Pittsburgh, Pa.
Thick or thin—Cement and compounds. Jet Lube, Inc., Burbank, Calif.
Thinline—Air conditioning units. General Electric Co., Major Appliance Div., Louisville, Ky.
Thin Man—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Thin Tube—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Thor—Belting. Goodyear Tire & Rubber Co., Akron, O.
Thorobred cog belt—V belts and v-belt drives. Dayton Rubber Co., Dayton, O.
Thoro-Mix—Burners. Siemon Mfg. Co., Grandview, Mo.
Thread-Tite—Cement and compounds. Armite Laboratories, Los Angeles, Calif.
Thredolets—Fittings. Bonney Forge & Tool Wks., Allentown, Pa.
3C—Motor controls. Clark Controller Co., Cleveland, O.
3M—Cements and compounds, adhesives, insulation. Minnesota Mining & Mfg. Co., St. Paul, Minn.
3 Way Weather-Flo—Thermostats. Automatic Devices Co., Inc., Western Springs, Ill.
Throway—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Thur-Ma-Lox—Coatings. Dampney Co. of America, Hyde Park, Boston, Mass.
Tico—Galvanized sheet steel. Inland Steel Co., Chicago, Ill.
Tico—Galvanized Sheet Steel. Inland Steel Products Co., Milwaukee, Wis.
Ticosteam—Boilers. Titusville Iron Works Co., The, Titusville, Pa.
Ticotherm—Boilers. Titusville Iron Works Co., The, Titusville, Pa.
Tilt Trap—Steam traps. Nason Co., Clarkston, Mich.

Timercoid—Time switches. Mercoid Corp., Chicago, Ill.
Timerelay—Relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Time-O-Stat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Tin-Ezy—Coatings, solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Tinol—Solder and fluxes. American Solder & Flux Co., Philadelphia, Pa.
Tiny—Traps. Nason Co., Clarkston, Mich.
Titan—Traps. Nason Co., Clarkston, Mich.
Tite Kote—Sheets. Reeves Steel & Mfg. Co., Dover, O.
Tite Seal—Cement and compounds. Radiator Specialty Co., Charlotte, N. C.
Toastmaster—Heaters. McGraw Electric Co., Chicago, Ill.
Toledo—Steam trap floats. Reichert Float & Mfg. Co., Toledo, O.
Tom Thumb—Pipe machines. Oster Mfg. Co., Cleveland, O.
Tool-Arc—Electrodes. Alloy Rods Co., York, Pa.
Toolweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Torchmaster—Torches. Deutsch Co., The, Los Angeles, Calif.
Torchweld—Regulators, valves, welding and cutting apparatus. National Cylinder Gas Co., Chicago, Ill.
Torkflash—Wrenches. Blackhawk Mfg. Co., Milwaukee, Wis.
Tork Grip—Benders. Parker Appliance Co., The, Cleveland, O.
Tork Master—Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.
Torkotherm—Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.
Tork Weather Control—Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.
Torpedo—Dehydrators, filters, strainers. Imperial Brass Mfg. Co., Chicago, Ill.
Torqometer—Torque indicating wrenches. Snap-on Tools Corp., Kenosha, Wis.
Torq-Stop—Wrenches. Richmont, Inc., San Gabriel, Calif.
Torque-Arm—Reducers. Dodge Mfg. Corp., Mishawaka, Ind.
Torrid—Torches. Polis Mfg. Co., J. D., Chicago, Ill.
Totalume—Paint. Wilbur & Williams Co., Brighton, Mass.
Totrust—Protective coatings, enamels and lacquers. Wilbur & Williams Co., Brighton, Mass.
Trace—Refrigerant leak detectors. Highside Chemicals Co., A Unit of Stewart Industries, Inc., Clifton, N. J.
Tramrail—Conveyors. Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, O.
Transaire—Transmitters. Taylor Instrument Companies, Rochester, N. Y.
Transflex—Plastic tubing. Irvington Varnish and Insulator Div. of Minnesota Mining and Mfg. Co., Irvington, N. J.
Transite—Conduit, pipe, ducts and duct fittings, refractories, sheets and board. Johns-Manville, New York, N. Y.
Transparent—Analyzers, gages, manometers. Dwyer Mfg. Co., F. W., Michigan City, Ind.
Trantex—Adhesives, and pipe wrap. Johns-Manville, New York, N. Y.
Trap-Dri—Dehydrators. A-P Controls Corp., Milwaukee, Wis.
Trap-it—Filters, strainers. A-P Controls Corp., Milwaukee, Wis.
Treet-O-Control—Steam system and water treatment. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Treet-O-Unit—Feeders, pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Trentweld—Tubing. Crucible Steel Co. of America, Pittsburgh, Pa.
Triad—Stocks and dies. Nye Tool & Machine Co., Chicago, Ill.
Triangle—Water heaters. Day & Night Div., Affiliated Gas Equip., Inc., Monrovia, Calif.
Tribune—Hose. Continental Rubber Wks., Erie, Pa.
Tri-Clad—Motors. General Electric Co., Apparatus Dept., Schenectady, N. Y.
Trident—Meters. Neptune Meter Co., New York, N. Y.
Tri-Flex—Registers, grilles. Tuttle & Bailey, Inc., New Britain, Conn.
Tri-Flux—Motors. Redmond Co., Inc., Owosso, Mich.
Tri-Flux—Solder. Wolfe-Kote Co., Inc., Sheboygan, Wis.
Tri-Guard—Protective coatings. Foster Co., Benjamin, Philadelphia, Pa.
Trimline—Radiation. Vulcan Radiator Co., Hartford, Conn.
Trimo—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.
Trimo—Pipe wrenches. Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Trimo Alloy—Pipe wrenches. Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Trimo Spiral Grip—Pipe wrenches. Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Trimrad—Radiation. Koven & Bro., Inc., L. O., Jersey City, N. J.
Trimtherm—Thermostats. General Controls Co., Glendale, Calif.
Triple-A—Enamels and lacquers, paint, protective coatings. Quigley Co., Inc., New York.
Triple-lok—Fittings. Parker Appliance Co., The, Cleveland, O.
Triple-Seal—Fittings. Imperial Brass Mfg. Co., Chicago, Ill.
Triplex—Stocks and dies. Nye Tool Co., Chicago, Ill.
Tripl-Aire—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
Tripl-Mix—Cement. Krehbiel Co., J. H., Chicago, Ill.
Tri-Rotor—Pumps. Yale & Towne Mfg. Co., Stamford, Conn.
Tri-snap—Thermostats. Westinghouse Electric Corp., Pittsburgh, Pa.
Triumph—Gages and indicators. Boston Auto Gage Co., Pittsfield, Mass.
Trojan—Boilers. Burnham Corp., Irvington, N. Y.
Trojan—Stokers. Auburn Burner Co., Auburn, Ind.
Tropelite—Coatings. Tropical Paint Co., Cleveland, O.
Tropic-Aire—Air conditioning units. McGraw Electric Co., Clark Div., Chicago.
Tropic-Breeze—Air conditioning units. Dalzen Mfg. Co., St. Clair, Mich.
Tropilux—Enamels and lacquers. Tropical Paint Co., Cleveland, O.
Tru-Air—Air conditioning units, condensers, dehumidifiers, heaters. Blazer, M., & Son, Passaic, N. J.
True Heat—Radiation. Pacific Steel Boiler Div., National-U.S. Radiator Corp., Johnstown, Pa.
True-Pitch Levee—Tools. Dreier Bros., Inc., Chicago, Ill.
Truespot—Testers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Truflex—Bi-metals. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Truflex—Drives, V. Belt. Gates Rubber Co., The, Denver, Colo.
Truk-Cel—Unit coolers. Dole Refrigerating Co., Chicago, Ill.
Truliradiant—Gas burners. Gordon & Piatt, Inc., Winfield, Kan.
Truliradiant—Gas burners. Sullivan Valve & Engineering Co., Butte, Mont.
Tru-Perimeter—Heating systems. Webster & Co., Warren, Camden, N. J.
Tru-Set—Fasteners. Ramset Fastening System, Winchester-Western Div., Olin-Mathieson Chemical Corp., Cleveland, O.
Try-Me—Regulators, strainers, valves. Tryco Products, Inc., Westfield, Mass.
Tubecote—Protective coatings. Wilhelm Co., A., Reading, Pa.
Tube-Tite—Pipe hangers and supports. Titchener, E. H. & Co., Binghamton, N. Y.
Tuff-Bond—Adhesives, cement, insulation. Moore Inc., Goodloe E., Danville, Ill.
Tufflex—Bases and pads, insulation. Wood Conversion Co., St. Paul, Minn.
Tuf-flex—Gage and sight glasses. Libbey-Owens-Ford Glass Co., Toledo, O.
Tufflite—Pipe. Michigan Plastic Pipe Co., Detroit, Mich.
Tuff-Weld—Fasteners, hangers. Moore Inc., Goodloe E., Danville, Ill.
Tuf-On—Protective coatings. Brooklyn Varnish Mfg. Co., Brooklyn, N. Y.
Tulox—Tubing. Extruded Plastics, Inc., Norwalk, Conn.
Tumblin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Tungweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Turbinair—Motors. Joy Mfg. Co., Pittsburgh, Pa.
Turbine Driven—Heaters. Wing Mfg. Co., L. J., New York, N. Y.
Turbo—Air washers, spray nozzles. Bayley Blower Co., Milwaukee, Wis.
Turbo-Aire—Overfire air jets. Canton Stoker Corp., Canton, O.
Turbo-Fire—Burners. Gordon & Piatt, Inc., Winfield, Ks.
Turbo-Flo—Water chillers. Drayer-Hanson, Inc., Subsidiary of National-U.S. Radiator Corp., Los Angeles, Calif.
Turbo Vane—Fans and blowers. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Turbulaire—Dryers. Western Precipitation Corp., Los Angeles, Calif.
Turcoat—Coatings. Turco Products, Inc., Los Angeles, Calif.
Tu-way—Radiation. Brown Products Co., Forest Hills, N. Y.
20th Century—Bearings. Roller Bearing Co., of America, West Trenton, N. J.
Twin Contact—Systems, thermostats. General Controls Co., Glendale, Calif.
Twindow—Heat insulating windows. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Twindoweld—Heat insulating windows. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Twin-Flow—Cooling towers. Marley Co., The, Kansas City, Mo.
Twin G-Fin—Preheaters. Griscom-Russell Co., The, Massillon, O.
Twin-Line—Pumps. Cooper-Bessemer Corp., The, Mt. Vernon, O.
Twin Seal—Check valves, gage testers. Mansfield & Green, Cleveland, O.
Two-Tank-T—Oil burner filters. Barclay, Inc., Robert, Chicago, Ill.
Tygon—Protective coatings, plastic tubing. U. S. Stoneware Co., New York, N. Y.
Tygon—Protective coatings, plastic tubing. United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Tylox—Pipe couplings. United States Stoneware Co., New York, N. Y.

U S—Fittings, flanges, tank plugs. U. S. Plug & Fitting Co., Wellington, O.
USG—Louvers and shutters. United States Gypsum Co., Chicago, Ill.
U. S. S.—Angles, sheets. United States Steel Co., Pittsburgh, Pa.
U. S. S.—Pipe, tubing. National Tube Div., United States Steel Corp., Pittsburgh, Pa.
U-S-S—Sheets, angles. Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
USS—Sheets. Tennessee Coal, Iron & Railroad Co., United States Steel Corp. Subsidiary, Birmingham, Ala.
U. S. White Star—Valves. Powell Co., Wm., The, Cincinnati, O.
U-Brand—Fittings. Union Malleable Mfg. Co., Ashland, O.
Ucilon—Protective coatings, high temperature paint. United Chromium Div., Metal & Thermit Corp., New York.
U-Cote—Pipe fittings. Union Malleable Mfg. Co., Ashland, O.
Ugasco—Gaskets. United States Gasket Co., Camden, N. J.
U-Loy—Sheets. Republic Steel Corp., Cleveland, O.
Ultra-Aire—Filters. Mine Safety Appliances Co., Pittsburgh, Pa.
Ultrafine—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Ultralite—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Ultra-Viscoson — Viscosimeters. Rich-Roth Laboratories, East Hartford, Conn.
Unaflow—Steam engines. Ames Iron Works, Div. of Pierce Butler Radiator Corp., Oswego, N. Y.
Unarco—Insulation, gaskets, packing, Insulating cement, condensers, heaters, radiation, surface cooling & heating, towers, air conditioning units. Union Asbestos & Rubber Co., Chicago, Ill.
Unbrako—Repair plugs, socket screws. Standard Pressed Steel Co., Jenkintown, Pa.
Unibestos—Insulation. Union Asbestos & Rubber Co., Chicago, Ill.
Uni-cast—Motors. Redmond Co., Inc., Owosso, Mich.
Unichrome—Enamels and lacquers, protective coatings. United Chromium Div., Metal & Thermit Corp., New York.
Uniclosed—Electric motors. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Unicoils—Finned surfaces. Clarage Fan Co., Kalamazoo, Mich.
Unicon—Refrigerating condensers. Kramer Trenton Co., Trenton, N. J.
Uni-fin—Registers, regulators. Barber-Colman Co., Rockford, Ill.
Uniflare—Fittings. Scovill Mfg. Co., Waterbury, Conn.
Uni-Flo Air Valves—Valves. Barber-Colman Co., Rockford, Ill.
Uni-flo—Diffusers, grilles, registers. Barber-Colman Co., Rockford, Ill.
Uniflow—Oil burners. Ace Engineering Co., Chicago, Ill.
UniMatic—Electrodes. Eutectic Welding Alloys Corp., Flushing, N.Y.
Union—Valves. Powell Co., Wm., The, Cincinnati, O.
Unipack—Welding fume exhausters, centrifugal fans. American Machine Products Co., Marshalltown, Ia.
Uni-Pull—Flat belt drives. Rhoads & Sons, J. E., Philadelphia, Pa.
Unipump—Pumps. Weinman Pump Mfg. Co., Columbus, O.
Unishears—Electric shears. Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Unisorb—Bases and pads. Felters Company, The, Boston, Mass.
Unistage—Aftercoolers. Schramm, Inc., West Chester, Pa.
Unistoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Uni-Strainer—Strainers. Perfecting Service Co., Charlotte, N. C.
Unitair—Air compressors. Joy Mfg. Co., Pittsburgh, Pa.

Unitaire—Air conditioning units. Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Unitem—Heaters. Bell & Gossett Co., Morton Grove, Ill.
Unitherm—Unit heaters. Clarage Fan Co., Kalamazoo, Mich.
Unitite—Valves. Hanna Engineering Wks., Chicago, Ill.
Unit-Line—Pumps. Johnston Pump Co., Pasadena, Calif.
UniTrane—Air conditioning units and coolers. Trane Co., The, La Crosse, Wis.
Uni-Trap—Steam traps. Perfecting Service Co., Charlotte, N. C.
Unitype—Pumps. Pacific Pumping Co., Oakland, Calif.
Universal—Benders. Hossfeld Mfg. Co., Winona, Minn.
Universal Burners. Dalzen Mfg. Co., St. Clair, Mich.
Universal—Cast iron pipe. Central Foundry Co., Newark, N. J.
Universal—Centrifugal pumps. Bell & Gossett Co., Morton Grove, Ill.
Universal—Gas and oil burners. Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Universal—Packing. Johns-Manville, New York, N. Y.
Universal—Pipe cutters. Nye Tool Co., Chicago, Ill.
Universal—Pumps, air conditioning units. Wright Mfg. Co., Phoenix, Ariz.
Universal—Regulators. Dockson Corp., Detroit, Mich.
Universal Unaflow—Engines. Skinner Engine Co., Erie, Pa.
Uni-Wash—Dust collectors. Newcomb-Detroit Co., Detroit, Mich.
Uno Turbine—Ventilators. Uno Ventilator Co., Malden, Mass.
Uno Venturette—Ventilators. Uno Ventilator Co., Malden, Mass.
Urefoam—Insulating cement, pipe insulation. Atlas Mineral Products Co., Mertztown, Pa.
UsAIRco—Air conditioning equipment, blowers, condensers, fans, heaters. United States Air Conditioning Corp., Minneapolis, Minn.
Uskon—Conductors. United States Rubber Co., New York, N. Y.
Utilitube.—Aluminum tubing. Aluminum Co. of America, Pittsburgh.
Utility—Blowers. American Blower Corp., Detroit, Mich.
Utility—Roof ventilators. Arex Co., Chicago.
Utility—Heaters. Wing Mfg. Co., L. J., New York, N. Y.

VB—Insulation. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
V*S—Changers. Reliance Electric & Engineering Co., Cleveland, O.
Vacu-Flo—Fittings. H-P Products, Inc., Louisville, O.
Vacumatic—Ejectors, pumps. Whittington Pump & Engineering Corp., Indianapolis.
Vacuum Cold Plate—Coils and panels. Dole Refrigerating Co., Chicago, Ill.
Vacuumstat—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Vad—Cooling towers. Young Radiator Co., Racine, Wis.
Valcalox—Damper regulators. Young Regulator Co., Cleveland, O.
Valvactor—Valve operators. Foxboro Co., Foxboro, Mass.
Valvent—Roof ventilators, Stwartwout Co., Cleveland, O.
Valvrator—Valves. Fischer & Porter Co., Hatboro, Pa.
Vanco—Louvers and shutters. Van Noorden Co., E., Boston, Mass.
Vanco Exhaustmaster—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco "QR"—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco Simplex—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco Upblast—Ventilators. Van Noorden Co., E., Boston, Mass.
Van Cor—Ducts and duct fittings, plastic pipe fittings, plastic pipe, plastic sheets and valves. Colonial Plastics Mfg. Co., Cleveland, O.
Vane-Runner—Vanes. Duro-Dyne Corp., Hempstead L. I., N. Y.
Vape-Sorber—Filters, Selas Corp. of America, Philadelphia, Pa.
Vaporene—Corrosion inhibition. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Vapor-Clarkson—Heating and process boilers. Vapor Heating Corp., Chicago, Ill.
Vaporstat—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Vapowall—Insulation. MMM, Inc., Houston, Tex.
Varidrive—Speed changers. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Vari-Pitch—Speed changers, pulleys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Vari-Temp—Air conditioning units. Dunham Co., C. A., Chicago, Ill.
Vari-Vac—Heating systems. Dunham Co., C. A. Chicago, Ill.
Vari-Vent—Valves. Dole Valve Co., Chicago.
Vaultmaster—Air conditioning units. Haertel Co., Walter, Minneapolis, Minn.
Vcon—Oil. Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Veco—Analyzers, combustion testing kits, Recorders, testers. Victory Engineering Corp., Union, N. J.
Veeco—Leak detectors. Vacuum-Electronic Engineering Co., New Hyde Park, L. I.
Vee Jet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Veelos—V-belts. Manheim Mfg. & Belting Co., Manheim, Pa.
Velometer—Air velocity meters, anemometers. Illinois Testing Laboratories, Inc., Chicago.
Ventalarm—Alarms, gages. Scully Signal Co., Melrose, Mass.
Ventbestus—Connections, duct, flexible. Ventfabrics, Inc., Chicago, Ill.
Ventglas—Connections, duct, flexible. Ventfabrics, Inc., Chicago, Ill.
Ventlab—Connections, duct, flexible. Ventfabrics, Inc., Chicago, Ill.
Vento—Traps. Haines Div., William S. Sellers Injector Corp., Philadelphia.
Vent-Rite—Air valves. Anderson Products, Inc., Cambridge, Mass.
Ventube—Ducts and duct fittings. E. I. du Pont de Nemours & Co., Inc., Fabrics & Finishes Dept., Wilmington, Del.
Ventura—Fans. American Blower Corp., Detroit, Mich.
Venturafin—Unit heaters. American Blower Corp., Detroit, Mich.
Venturi—Fan housings. Commercial Shearing & Stamping Co., Youngstown, O.
Venturi—Meters, nozzles. Builders-Providence, Inc., Div. of B-I-F Industries Inc., Providence, R. I.
Venturi-Flo—Air diffusers. Barber-Colman Co., Rockford, Ill.
Venturi One—Fittings. Taco Heaters, Inc., Cranston, R. I.
Venturi-Top—Caps. Walker Mfg. & Sales Co., St. Joseph, Mo.
Vent-Vac—Heating systems. Anderson Products, Inc., Cambridge, Mass.
Ventyvinyl—Connections. Ventfabrics, Inc., Chicago, Ill.
Verco—Insulating cement. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Vercoustic—Insulation. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Verithin-Microrold—Steel sheets. Washington Steel Corp., Washington, Pa.
Vermiculite—Insulation. International Vermiculite Co., Girard, Ill.
Vermiculite—Insulation. Nelson Mfg. Co., C. B., Minneapolis, Minn.
Vernier-Set—Time switches. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Vertiflow—Unit heaters. Young Radiator Co., Racine, Wis.
V-Flat—Pulleys and sheaves. Dayton Rubber Co., Dayton, O.
Vibracork—Bases and pads. Korfund Co., Inc., Long Island City, N. Y.
Vibraglass—Bases and pads. L. O. F. Glass Fibers Co., Toledo, O.
Vibrashock—Bases and pads. Robinson Aviation, Inc., Vibrashock Div. Teterboro, N. J.
Vibra-sorber—Vibration absorbers. Flexonics Corp., Maywood, Ill.
Vibrastop—Duct connections. Grant Wilson, Inc., Chicago, Ill.
Vibration Eliminators—Adsorbers. American Metal Hose Div., American Brass Co., Waterbury, Conn.
Vibro-Hangers. Pipe hangers and supports. Korfund Co., Inc., Long Island City, N. Y.
Vibro Insulators—Bases. Goodrich Co., B. F., Akron, O.
Vibro-Isolator—Bases and pads, vibration absorbers. Korfund Co., Inc., Long Island City, N. Y.
Vichrome—Coatings, enamels. Interchemical Corp., Finishes Div., Newark, N. J.
Vic-O-Seal—Gaskets. Vickers, Inc., Div. of Sperry Corp., El Segundo, Calif.
Victory—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Viking—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
V-in-Tah—Paint. Valdura Div., American-Marietta Co., Chicago, Ill.
Vim—Belting, gaskets, leather packing. Houghton & Co., E. F., Philadelphia, Pa.
Vim Tred—Leather belting. Houghton & Co., E. F., Philadelphia, Pa.
Vinsynite—Coatings. Thompson and Co., Oakmont, Pa.
Vinyl—Coatings. Gates Engineering Co., Wilmington, Del.
Vinyl—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.
Visaflame—Controls. Mercoid Corp., The, Chicago, Ill.
Visco—Preheaters. Crotty Mfg. Corp., Long Island, N. Y.
Viscograph—Viscosimeters. Brabender Corp., Rochelle Park, N. J.
Viscorator—Viscosimeters. Fischer & Porter Co., Hatboro, Pa.
Visi-Flare—Tools. Parker Appliance Co., The, Cleveland, O.
Visi-Flo—Sight glasses. O P W Corp., Cincinnati, O.
Visi-Float—Air filter gages. F. W. Dwyer Mfg. Co., Michigan City, Ind.
Visoleak—Leak detectors. Allin Mfg. Co., Chicago, Ill.
Vistand—Vise stands. Armstrong Mfg. Co., Bridgeport, Conn.
Vitalic—Hose. Continental Rubber Wks., Erie, Pa.
Vitalloy—Wrenches. Billings & Spencer Co., Hartford, Conn.
Vitreon—Pipe. Robinson Clay Product Co., Inc., The, Akron, O.
Vitricel—Refractories. Carey Mfg. Co., Philip, The, Lockland, Cinncinnati, O.
Vitriram—Furnace cement. U. S. Stoneware Co., New York, N. Y.
Vix-Syn—Rubber and synthetic packing. Houghton & Co., E. F., Philadelphia, Pa.
V-Meth-L—Refrigerants. Virginia Smelting Co., West Norfolk, Va.
Volcano—Ventilators. Iwan Brothers, South Bend, Ind.
Volcano—Torches. Deutsch Co., The, Los Angeles, Calif.
Vol-O-Flo—Meters. National Instrument Laboratories, Inc., Riverdale, Md.
Vornado—Fans, motors, air conditioning units. Sutton Corp., O. A., The, Wichita, Kans.
Vortex—Pumps. Lawrence Pump & Engine Co., Lawrence, Mass.
V-to-V—Pulleys and sheaves. Dayton Rubber Co., Dayton, O.
Vulcalock—Fittings, pipe, tanks, valves. Goodrich Co., B. F., Akron, O.
Vulcan—Stands, tongs, vises. Williams & Co., J. H., Buffalo, N. Y.
Vulcan—Stokers. Canton Stoker Corp., Canton, O.
Vulcan-Hartford—Heating surface. Vulcan Radiator Co., Hartford, Conn.
Vulcan Superior—Tongs, vises. Williams & Co., J. H., Buffalo, N. Y.
Vulco—Belts, drives, pulleys. Gates Rubber Co., Denver, Colo.
Vulcomount—Pulleys. Gates Rubber Co., Denver, Colo.

W. & McD.—Strainers. Watson & McDaniel Co., Philadelphia, Pa.
W-S—Fittings. Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
W & T—Chlorinators, feeders, gages, indicators. Wallace & Tiernan Inc., Belleville, N. J.
W.T.E.—Boilers. Murray Iron Works Co., Burlington, Ia.
WTP—Boilers. Titusville Iron Wks., Co., The, Titusville, Pa.
W & W—Pipe hangers. Western Wire Products Co., St. Louis, Mo.
Waikiki—Heaters. Vapor Heating Corp., Chicago, Ill.
Wakefield—Coils, fittings, pipe, pumps, tanks and valves. Lead Lined Iron Pipe Co., Wakefield, Mass.
Walco-Parmelee—Wrenches. Walworth Co., New York, N. Y.
Walltube—Radiator brackets. Arjac Products Inc., Rochester, N. Y.
Walseal—Fittings, valves. Walworth Co., New York, N. Y.
Walvector—Radiation. Webster & Co., Warren, Camden, N. J.
Warco—Valves. Bridgeport Brass Co., Bridgeport, Conn.
Warco—Fuel oil treatment. Warren Refining & Chemical Co., The, Cleveland, O.
Warcolite—Enamels and lacquers. Warren Refining & Chemical Co., The, Cleveland.
Warnock—Wrenches. Lowell Wrench Co., Worcester, Mass.
Watch Dog—Meters. Worthington-Gamon Meter Div., Worthington Corp., Newark, N. J.
Watco—Cooling towers. Water Cooling Corp., New York, N. Y.
Water-Boy—Feeders, alarms, valves. Maid-O'-Mist, Inc., Chicago, Ill.
Waterfilm—Boilers. Koven & Bros., L. O., Inc., Jersey City, N. J.
Water-King—Pumps. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Water Maker—Water heaters. Catskill Metal Works, Inc., Catskill, N. Y.
Water-Mund—Heaters. Mund Boilers, Inc., Los Angeles, Calif.
Waterspar—Enamels and lacquers. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Wa-Trol—Regulators. Thermal Agency, Houston, Tex.
Way Loctor—Doors and panels. Walsh, The, L. M., Co., Boston, Mass.
Wear-Arc—Electrodes. Alloy Rods Co., York, Pa.

Wear-Arc "Super WH"—Electrodes. Alloy Rods Co., York, Pa.
Wear-Proof—Pumps. Schneible Co., Claude B., Detroit, Mich.
Wearweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Weather—Protective coatings. Minnesota Mining & Mfg. Co., St. Paul, Minn.
Weather-Chron—Switches. Automatic Devices Co., Inc., Western Springs, Ill.
Weather-Damper—Regulators. Automatic Devices Co., Inc., Western Springs, Ill.
Weather-Flo—Thermostats, control systems, regulators. Automatic Devices Co., Inc., Western Springs, Ill.
Weathermaker—Unit air conditioners. Carrier Corp., Syracuse, N. Y.
Weather-Man—Regulators, thermostats, control systems. Automatic Devices Co., Inc., Western Springs, Ill.
Weatherstat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Weatherwise—Air conditioning units. Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Weber's—Forty-Eight Insulations, Inc., Aurora, Ill.
Webster-Nesbitt—Unit heaters. Webster & Co., Warren, Camden, N. J.
Webster-Nesbitt "Little Giant"—Unit heaters. Nesbitt, Inc., John J., Philadelphia, Pa.
Webster Ross—Pipe joints. Webster & Co., Warren, Camden, N. J.
Weco—Gas burners. Webster Engineering Co., Tulsa, Okla.
Weco—Plugs, steel unions. Cheksan Co., Brea, Calif.
Wedgbelt—V belts and v-belt drives, pulleys. American Pulley Co., Philadelphia, Pa.
Wedge-Lock—Pipe. Robinson Clay Product Co., The, Akron, O.
Wee Scot—Boilers. Titusville Iron Works Co., The, Titusville, Pa.
Weir—Stokers. Meyer Furnace Co., The, Peoria, Ill.
Weiralead—Lead alloy coated sheets. Weirton Steel Co., Weirton, W. Va.
Weir-Meyer—Furnaces. Meyer Furnace Co., The, Peoria, Ill.
Weirzin—Electrolytic zinc coated sheets. Weirton Steel Co., Weirton, W. Va.
Weldaluminite—Welding compounds. Special Chemicals Corp., Ossining, N. Y.
Weldells—Welding fittings. Taylor Forge & Pipe Works, Chicago, Ill.
Weld-Ends—Couplings. Wachs Co., E. H., The, Chicago, Ill.
Weld-Ends—Pipe couplings, fittings. Pipeline Development Co., Cleveland, O.
Weldolets—Fittings. Bonney Forge & Tool Works, Allentown, Pa.
WesCo—Solenoids. West Coast Electric Mfg. Co., Los Angeles, Calif.
Western—Fans, furnaces, heaters. International Sales Co., San Francisco, Calif.
Western—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.
Westernaire—Fans. Western Engineering & Mfg. Co., Venice, Calif.
Western Roll-Bond—Heat exchangers. Olin Mathieson Chemical Corp., Metals Div., New York, N. Y.
West-Flex—Bellows, hose. Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Westo—Water treatment. Western Chemical Co., Kansas City, Mo.
Wheeler-Economy—Ejectors, pumps. Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Whirlcone—Spray nozzles. Water Cooling Equipment Co., St. Louis, Mo.
Whirljet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Whisper-Quiet—Heaters. Zink Co., John, Tulsa, Okla.
White Star—Valves. Powell Co., Wm., The, Cincinnati, O.
Whitson—Steam traps. Healy Ruff Co., St. Paul, Minn.
Wig-O-Flex—Couplings. Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Wigwam Thermcap—Vent flue caps. Boston Machine Works Co., Lynn, Mass.
Wilco—Bi-metals. Wilson Co., H. A., The, Union, N. J.
Wilco—Pipe cutting machines. Oster Mfg. Co., Cleveland, O.
Williams-Hager—Valves. Williams Gauge Co., Inc., The, Pittsburgh, Pa.
Wilmington—Air compressors. Electric Sprayit Co., The, Sheboygan, Wis.
Wind-A-Clamp—Hose clamps. Manufacturers Corp., Mansfield, O.
Wind-A-Clamps—Hose clamps. Richland Co., Mansfield, O.
Windial—Anemometers. Friez Instrument Div., Bendix Aviation Corp., Baltimore.
Windmaker—Fans. Rich Fan Mfg. Co., Inc., Phil, Houston, Tex.
Wind-O-Cool—Fans. Belco Industries, Inc., St. Louis, Mo.
Wind-O-Vent—Window ventilator and filter units. Reed Unit-Fans, Inc., New Orleans.
Wingfoil—Ventilators, exhausters. Wing Mfg. Co., L. J., Linden, N. J.
Winkler—Burners, boilers, furnace, stokers, air conditioning units. Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Winter-Chaser—Air conditioning units, furnaces, heaters. Campbell Heating Co., Des Moines, Ia.
Wissco—Grilles. Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Witch—Bolts, clamps, hangers, protectors. Carpenter & Paterson, Inc., Cambridge, Mass.
Wolfe-Linde—Condensers, fittings, flanges, strainers, valves. Dersch, Gesswein & Neuert, Inc., Chicago.
Wonder—Tubing benders. American Pipe Bending Machine Co., Inc., Poultney, Vt.
Wondaire—Heaters. Cox Mfg. Co., Ridgeville, Ind.
Wovenstone—Pipe insulation. Union Asbestos & Rubber Co., Cicero, Ill.
Wurtzilite—Coatings. Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y.

X-L—Gaskets, packing. Excelsior Leather Washer Co., Rockford, Ill.
"X" Boilerliquid—Compounds. X Laboratories, Inc., New York, N. Y.
"X" Flush-Rustoff—Boiler cleaning compounds. X Laboratories, Inc., New York.
"X" Pipecut Oil—Cutting oil. X Laboratories Inc., New York, N. Y.
"X" Pipejoin—Cement and compounds. X Laboratories, Inc., New York, N. Y.
"X" Rustoff—Treatment, water, to inhibit corrosion. X Laboratories, Inc., New York, N. Y.
Xit—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.
XV Valve—Valves. Farris Flexible Valve Corp., Palisades Park, N. J.
Xyron—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.

YAC—Air conditioning units. Young Radiator Co., Racine, Wis.
Yager's—Solder. Benson Co., Inc., Alex R., Hudson, N. Y.
Yarway—Alarms, clamps, expansion joints, recorders, nozzles, strainers, traps. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Seatless—Valves. Yarnall-Waring Co., Philadelphia, Pa.
Yoloy—Pipe, sheet, tubing. Youngstown Sheet & Tube Co., Youngstown, O.
Yorkaire—Unit air coolers. York Corp., York, Pa.
York-Power—Oil burners. York-Shipley, Inc., York, Pa.
Yulatrol—Fuel oil preheaters. Yula Water Heaters, Inc., Bronx, N. Y.

Zaflo—Enamels and lacquers. Atlas Powder Co., North Chicago, Ill.
Zaponite—Enamels and lacquers. Atlas Powder Co., North Chicago, Ill.
Zatex—Enamels and lacquers. Atlas Powder Co., North Chicago, Ill.
Z-Crete—Pipe insulation. Zonolite Co., Chicago, Ill.
Zephyrweld—Pipe fittings. Tri-Clover Machine Co., Kenosha, Wis.
Zerex—Anti-freeze compounds. du Pont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del.
Zero—Cement, refractories. Standard Fuel Engineering Co., Detroit, Mich.
Zero—Pipe insulation. Johns-Manville, New York, N. Y.
Zerolite—Pipe insulation. Johns-Manville, New York, N. Y.
Zeropaks—Coolers. McQuay, Inc., Minneapolis, Minn.
Zig Zag—Heat exchangers. Stout & Sons, David, St. Louis, Mo.
Zinaloy—Zinc sheets. Matthiessen & Hegeler Zinc Co., La Salle, Ill.
Zincgrip—Sheets. Armco Steel Corp., Middletown, O.
Zincilate—Coatings. Industrial Metal Protectives, Inc., Dayton, O.
Zincoater—Coatings. Tropical Paint Co., Cleveland, O.
Zinc Soot—Soot destroyers. Tamms Industries Inc., Chicago, Ill.
Zinodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Zipper—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Zip-Portable—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Zircon—Furnace and refractory cement, refractories. Taylor Sons Co., Charles, Cincinnati, O.
Zone-Master—Heating systems. General Heaters & Regulators Co., East Chicago, Ind.
Zone-Pac—Heating systems. Barber-Colman Co., Rockford, Ill.
Zonetrol—Systems. Acro Mfg. Co., The, Columbus, O.
Zytel—Plastics, powder and resins. duPont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del.

DIRECTORY SECTION
HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRY AND LARGE BUILDINGS

PART 4 — ALL MANUFACTURERS' ADDRESSES

A

A. & A. Register Co., 8327 Clinton Rd., Cleveland 9, O.
ACEC Electric Corp., 40 E. 49th St., New York 17, N. Y.
ACF Industries, 1501 E. Fery St., Detroit, Mich.
A.C.M.I. Borescope Div., American Cystoscope Makers, Inc., 1241 Lafayette Ave., New York 59, N. Y.
ACRC Div. Hills-McCanna Co., 3025 N. Western Ave., Chicago 18, Ill.
A'G'A Div. of Elastic Stop Nut Corp. of America, 1027 Newark Ave., Elizabeth 3, N. J.
A-J Mfg. Co., 3601 E. 18th St., Kansas City 27, Mo.
A-P Controls Corp., 2450 N. 32nd St., Milwaukee 45, Wis.
A.R.A. Mfg. Co., 1041 Foch St., Ft. Worth, Tex.
Abart Gear & Machine Co., 4828-36 W. 16th St., Chicago 50, Ill.
Abbeon Supply Co., 179-15 Jamaica Ave., Jamaica, N. Y.
Abbott & Biddle Co., 2413-27 Federal St., Philadelphia 46, Pa.
Able Metal Spinning & Stamping Co., 2009 Nameoke Ave., Far Rockaway 91, N. Y.
Accurate Sheet Metal Mfg. Works, 2336-40 Milwaukee Ave., Chicago
Ace Engineering Co., 1435 W. 15th St., Chicago 8, Ill.
Ace Instrument Co., Inc., 172 Pacific St., Brooklyn, N. Y.
Acer & Whedon, Inc., Medina, N. Y.
Acheson Mfg. Co., Braddock P. O., Rankin, Pa.
Acker Organization, Inc., W. M., 2430 Poplar Springs, Meridan, Miss.
Ackermann Mfg. Co., Wheeling, W. Va.
Acme Asbestos Covering & Flooring Co., 236 N. Elizabeth St., Chicago 7, Ill.
Acme Electric Corp., Cuba, N. Y.
Acme Electric Welder Co., 2618 Fruitland Ave., Los Angeles 58, Calif.
Acme Equipment Co., 205-13 E. Broadway, Muskogee, Okla.
Acme Industries, Inc., 600 N. Mechanic St., Jackson, Mich.
Acme Mfg. Co., 7500 State Rd., Philadelphia 36, Pa.
Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.
Acme Welding Div. of the United Tool & Die Co., 1031 New Britain Ave., West Hartford, Conn.
Acorn Paint & Chemical Co., 8001 Franklin Ave., Cleveland, O.
Acragage Corp., Wampus Lane, Milford, Conn.
Acro Mfg. Co., The, 2040 E. Main St., Columbus, O.
Acro Welder Mfg. Co., 1825 W. St. Paul Ave., Milwaukee 3, Wis.
Adam Electric Co., Frank, 3650 Windsor Pl., St. Louis 13, Mo.
Adams Co., The, E. 4th St., P. O. Box 268, Dubuque, Ia.
Adams Co., Inc., R. P., 225-7 E. Park Dr., Buffalo 17, N. Y.
Adams Mfg. Co., 1530 St. Clair Ave., Cleveland 14, O.
Adams Pipe Repair Products, 2453 Merced Ave., P. O. Box 111, El Monte, Calif.
Addison Products Co., Addison, Mich.
Adelta Mfg. Co., Inc., 21 & Ellsworth, Philadelphia 46, Pa.
Adjustable Clamp Co., 417 N. Ashland Ave., Chicago 22, Ill.
Admiral Corp., 3800 Cortland St., Chicago 47, Ill.
Adre Co., The, 8980 W. Warfield Ave., Hales Corner 3, Wis.
Advance Aluminum Castings Corp., 2742 W. 36th Pl., Chicago 32, Ill.
Advance Electric & Relay Co., 2435 N. Naomi St., Burbank, Calif.
Advance Pump Co., 2531 9th St., Berkeley, Calif.
Aerco Corp., Northvale, N. J.
Aero-Coupling Corp., 3015 Winona Ave., Burbank, Calif.
Aerofin Corp., 101 Greenway Ave., Syracuse 1, N. Y.
Aeroil Products Company, Inc., 69 Wesley St., South Hackensack, N. J.
Aeroquip, Inc., 1225 W. Main St., Van Wert, O.
Aeroquip Corp., 300 S. East Ave., Jackson, Mich.
Aerotec Corp., The, Greenwich, Conn.
Aerovent Fan Co., Inc., Ash and Barlow Sts., Piqua, O.
Aetna Ball & Roller Bearing Co., 4600 W. Schubert, Chicago, Ill.
Agava Products, Inc., 34 Exchange Pl., Jersey City 2, N. J.
Aget-Detroit Co., 613 First National Bldg., Ann Arbor, Mich.
Agnew & Tomlinson, 51-04 Vernon Blvd., Long Island City 1, N. Y.
Ahlberg Bearing Co., 3025 W. 47th St., Chicago 32, Ill.
Air Conditioning Engineering Co., 44 First St., Cambridge 41, Mass.
Air Conditioning Products Co., 2340 W. Lafayette Blvd., Detroit 16.
Air Control Products, Inc., Coopersville, Mich.
Air Controls, Inc., Div. of Cleveland Heater Co., 2310 Superior Ave., Cleveland 14, O.
Air-Cooling Engineering Co., P. O. Box 744, Evanston, Ill.
Aircraft Fitting Co., 11830 Brookpark Rd., Cleveland 30, O.
Air Devices, Inc., 185 Madison Ave., New York 16, N. Y.
Air Distribution Products Co., 116 S. LaBrea Ave., Los Angeles 36, Calif.
Air Equipment Co., 2730 Zuni St., Denver, Colo.
Air-Factors, Inc., 1624 S. Raymond Ave., Monrovia, Calif.
Air Fan Engineering Co., 7401 Telegraph Rd., Los Angeles 22, Calif.
Air Filter Corp., 108 N. Water St., Milwaukee 2, Wis.
Air-Net Appliance Corp., 1340 E. 55th St., Chicago 15, Ill.
Air Reduction Sales Co., Div. of Air Reduction Co., Inc., 60 E. 42nd St., New York 17, N. Y.
Air & Refrigeration Corp., 439 Madison Ave., New York 22, N. Y.
Aireactor Corp., 22 E. 40th St., New York 16, N. Y.
Aire-Foile Fan & Blower Co., 10047 West Fort, Detroit 9, Mich.
Airgard Mfg. Co., 362 W. Erie St., Chicago 10, Ill.
Airguide Instrument Co., 2210 Wabansia Ave., Chicago 47, Ill.
Airjet Ventilator Co., 5420 N. Peck Rd., El Monte, Calif.
Airkem, Inc., 241 E. 44 St., New York 17, N. Y.
Airmaster Corp., 4317 Ravenswood Ave., Chicago 13, Ill.
Airmatic Valve, Inc., 7317 Associate Ave., Cleveland 9, O.
Air-Maze Corp., 25000 Miles Rd., Cleveland 28, O.
Air-Path Products Co., 4620 Doll Ave., Baltimore 15, Md.
Air Purification Service, Inc., 136 Liberty St., New York, N. Y.
Airserco Mfg. Co., Inc., 435 Melwood St., Pittsburgh 13, Pa.
Air-Stream Filter Corp., 2100 Washington Ave., St. Louis 3, Mo.
Airtherm Mfg. Co., 711 S. Spring Ave., St. Louis 10, Mo.
Airtron Corp., Holland, O.
Airwasher Corp., Eaton Rapids, Mich.
Ajax Boiler & Heater Co., 1519 W. 132nd St., Gardena, Calif.
Ajax Corp. of America, 2509 Washington Ave., Evansville, Ind.
Ajax Flexible Coupling Co., Westfield, N. Y.
Ajax Furnace Fitting Co., Div. of Cincinnati Sheet Metal & Roofing Co., 216-220 E. Front St., Cincinnati 2, O.
Akron Metallic Gasket Co., 155 N. Union, P. O. Box 911, Akron 9, O.
Alabama Pipe Co., Anniston, Ala.
Aladdin Heating Corp., 1111 West Ave., 137, San Leandro, Calif.
Alan Wood Steel Co., Conshohocken, Pa.
Alberger Heater Div., ADSCO Industries, Inc., 20 Milburn St., Buffalo 12, N. Y.
Albert Pipe Supply Co., Berry & N. 13th, Brooklyn, N. Y.
Albertson & Co., Inc., Sioux City 3, Ia.
Alco Products, Inc., Schenectady 5, N. Y.
Alco Refrigeration Sales & Service, Inc., 3952 St. Clair Ave., Cleveland, O.
Alco Valve Co., 865 Kingsland Ave., St. Louis 5, Mo.
Aldrich Co., 105 E. Williams St., Wyoming, Ill.
Aldrich Pump Co., 4 Pine St., Allentown, Pa.
Alexander Bros., 406 N. 3rd, Philadelphia, Pa.
Allan Engineering Co., P. O. Box 1211, Dallas, Tex.
Allcraft Mfg. Co., 27 Hayward St., Cambridge, Mass.
Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa.
Allegheny Valve Co., 349 Pennsylvania Ave. W., Warren, Pa.
Allen-Bradley Co., 1335 S. First St., Milwaukee 4, Wis.
Allen Co., Inc., L. B., 6702 Bryn Mawr Ave., Chicago 31, Ill.
Allen Co., Robert G., P. O. Box 110, Mechanicsville, N. Y.
Allen Cooler & Ventilator, Inc., 704 Woodward, Rochester, Mich.
Allen Mfg. Co., W. D., 566 W. Lake St., Chicago 6, Ill.
Alliance Industries, Huntingden Valley, Pa.
Alliance Mfg. Co., Inc., Alliance, O.
Allied Control Co., Inc., 2 East End Ave., New York 21, N. Y.
Allied Porcenell, Inc., 851 S. Market St., Waukegan, Ill.
Allied Weld-Craft, Inc., 401 W. South St., Indianapolis 25, Ind.
Allin Mfg. Co., 1153 W. Grand Ave., Chicago 22, Ill.
Allington & Curtis Mfg. Co., 1800 Holland Ave., Saginaw, Mich.
Allis-Chalmers Mfg. Co., 1171 S. 70th St., Milwaukee 1, Wis.
Allis Co., Louis, The, 427 E. Stewart St., Milwaukee 7, Wis.
Allmetal Screw Products Co., Inc., 821 Stewart Ave., Garden City, Long Island, N. Y.
Alloy Propeller, Zelionople, Pa.
Alloy Rods Co., Lincoln Highway West, York, Pa.
Alloy Stainless Products Co., Union Blvd., Totowa, N. J.
Alloy Steel Products Co., 1322 W. Elizabeth Ave., Linden, N. J.
Allpax Co., Inc., Mamaroneck, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Alpha Metals, Inc., 56 Water St., Jersey City, N. J.
Alpha Plastics, Inc., 14 Northfield Rd., W. Orange, N. J.
Alphil Spot Welding Co., 1058 Pacific St., Brooklyn, N. Y.
Alrose Chemical Co., Box 1294, Providence 1, R. I.
Alstrom Corp., The, 790 E. 176 St., New York 60, N. Y.
Alton Mfg. Co., 1112 Ross Ave., Dallas 2, Tex.
Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.
Aluminum Wool Div., Carey Electronic Engineering Co., 1880 Clifton Ave., Springfield, O.
Alumiseal Corp., 429 E. 53rd St., New York 22, N. Y.
Amana Refrigeration, Inc., Amana, Ia.
Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.
American Agile Corp., P. O. Box 168, Bedford, O.
American Air Filter Co., Inc., 373 Central Ave., Louisville 8, Ky.
American Air Filter Co., Inc., Herman Nelson Products, 215 Central Ave., Louisville 8, Ky.
American Blow Pipe Co., 3549 W. Cermak Rd., Chicago 23, Ill.
American Blower Corp., Detroit 32, Mich.
American Brass Co., 414 Meadow St., Waterbury 20, Conn.
American Car & Foundry Co., 30 Church St., New York 8, N. Y.
American Cast Iron Pipe Co., 2930 N. 16th St., Birmingham 2, Ala.

American Chemical Paint Co., Brookside Ave., Ambler, Pa.
American Coal Burner and Wood Stoker Corp., 18 E. Erie St., Chicago 11, Ill.
American Coils Co., 360 Thomas St., Newark 5, N. J.
American Coolair Corp., 3604 Mayflower St., P. O. Box 2300, Jacksonville 3, Fla.
American Cooling Tower Co., 2710 McGee St., Kansas City 8, Mo.
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
American District Steam Div. of ADSCO Industries, 20 Milburn St., Buffalo 12, N. Y.
American District Telegraph Co., 155 Sixth Ave., New York, N. Y.
American Engineering Co., Aramingo Ave. and Cumberland St., Philadelphia 25, Pa.
American Felt Co., Glenville, Conn.
American Flange & Mfg. Co., Inc., 30 Rockefeller Plaza, New York 20.
American Flexible Coupling Co., 1810 Pittsburgh Ave., Erie, Pa.
American Foundry & Furnace Co., Washington St. at McClun, Bloomington, Ill.
American Furnace Co., 1300 Hampton Ave., St. Louis 10, Mo.
American Gas & Chemicals, Inc., 45 Rockefeller Plaza, New York 20, N. Y.
American Gilsonite Co., 134 W. Broadway, Salt Lake City 1, Utah
American Hair & Felt Co., 1828 Merchandise Mart, Chicago 54, Ill.
American Hard Rubber Co., 93 Worth St., New York 13, N. Y.
American Hydrotherm Corp., 33-70 12th St., Long Island City 6, N. Y.
American Hydrovac, Div. Pitz Foundry Inc., 290 Scholes St., Brooklyn 6, N. Y.
American Instrument Co., Inc., Silver Spring, Md.
American K. A. T. Corp., Garwood, N. J.
American Ladder & Scaffold Co., 5503 N. W. 7th Ave., Miami 38, Fla.
American Machine Products Co., 401 S. Third Ave., Marshalltown, Ia.
American Machine Wks., Inc., 1320 Clark St., Racine, Wis.
American Manganese Bronze Co., Rhawn & Hegerman Sts., Philadelphia, Pa.
American-Marsh Pumps, Inc., 60 Capital Ave., N. E., Battle Creek, Mich.
American Metal Hose Div., American Brass Co., The, 698 S. Main St., Waterbury 20, Conn.
American Metal Works, Inc., P. O. Box 7027, New Orleans, La.
American Meter Co., Inc., 1513 Race St., Philadelphia 2, Pa.
American Moistening Co., 260 W. Exchange St., Providence, R. I.
American Motors Corp., Kelvinator Div., 14250 Plymouth Rd., Detroit, Mich.
American Nickeloid Co., 113 Second St., Peru, Ill.
American Photocopy Equipment Co., 1920 W. Peterson Ave., Chicago 26, Ill.
American Pipe Bending Machine Co., Inc., 17 Furnace St., Poultney, Vt.
American Pipe & Steel Corp., 2201 W. Commonwealth Ave., Alhambra, Calif.
American Pipe Tool Co., 4856 W. Kinzie St., Chicago 44, Ill.
American Platinum Wks., 231 New Jersey Railroad Ave., Newark, N. J.
American Potash & Chemical Corp., Aerosol & Refrigeration Div., 3100 E. 26th St., Los Angeles, Calif.
American Pulley Co., The, 4200 Wissahickon Ave., Philadelphia 29.
American Radiator & Standard Sanitary Corp., P.O. Box 1226, Pittsburgh 30, Pa.
American Sand-Banum Co., Meadow Brook National Bank Bldg., Freeport, N. Y.
American Sanitary Mfg. Co., 308 Latimer St., Abingdon, Ill.
American Screw Co., Willimantic, Conn.
American Solder & Flux Co., 19th and Willard Sts., Philadelphia, Pa.
American Standard, Air Conditioning Div., 40 W. 40th St., New York, N. Y.
American Steel Band Co., P. O. Box 565, Pittsburgh, Pa.
American Steel & Wire Div., United States Steel, Rockefeller Bldg., Cleveland 13, O.
American Thermal Industries, Inc., 440 Illinois, Detroit 1, Mich.
American Tube Products, Inc., Riverdale Bldg., Natick, R. I.
American Warming & Ventilating Co., 1017-1021 Summit St., Toledo 4, O.
American Water Softener Co., Lehigh Ave. and 4th St., Philadelphia 33, Pa.
American Wells Wks., 100 N. Broadway, Aurora, Ill.
American Zinc Products Div., Ball Brothers Co., Greencastle, Ind.
Ames Iron Works, Inc., Oswego, N. Y.
Amic Mfg. Corp., 21-25 44th Ave., Long Island City, N. Y.
Aminco Refrigeration Products, American Injector Co., 1000 E. McNichols, Detroit 3, Mich.
Ammco Tools, Inc., North Chicago, Ill.
Ammerman Co., C. L., 104 N. 2nd St., Minneapolis 1, Minn.
Amp Corp., 2921 Locust St., St. Louis, Mo.
Ampion Corp., 4-88 47th Ave., Long Island City 1, N. Y.
Analytical Measurements, Inc., 585 Main St., Chatham, N. J.
Anchor Coupling Co., 342 N. 4th., Libertyville, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., P. O. Box 311, New Albany, Ind.
Anchor Packing Co., 401 N. Broad St., Philadelphia 8, Pa.
Andale Co., 1740 Cherry St., Philadelphia 3, Pa.
Andersen Corp., Bayport, Minn.
Anderson & Co., Inc., 3100 Lowell St., Sioux City, Iowa
Anderson Co., V. D., The, 1949 W. 96th St., Cleveland 2, O.
Anderson Chemical Co., Inc., 1620 Waterville Rd., Macon, Ga.
Anderson Diesel Engine Co., 6245 State Rd., Philadelphia 35, Pa.
Anderson Products, Inc., 17 Tudor St., Cambridge 39, Mass.
Anderson-Stolz Corp., 1731 Walnut St., Kansas City 8, Mo.
Anemostat Corp. of America, 10 E. 39th St., New York 16, N. Y.
Anesite Co., 3575 Touhy Lincolnwood, Chicago, Ill.
Anetsberger Bros., Inc., Northbrook, Ill.
Annis Air Filter Div., Royal Heaters, Inc., 1024 Westminster Ave., Alhambra, Calif.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Anthony Co., End of Baker, Streator, Ill.
Anti-Friction Bearings Co., 2020 S. Figueroa St., Los Angeles 7, Calif.
Applied Mechanics Co., 381 Congress St., Boston 10, Mass.
April Showers Co., Inc., 4126 Eighth St., N. W., Washington 11, D. C.
Aqua Electric Scale Control, Inc., 2026 E. 22nd St., Cleveland 15, O.
Aqua Matic, Inc., 2412 Grant, Rockford, Ill.
Aqua-Therm, Inc., 748 N. Main, Dayton, O.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Arabol Mfg. Co., 110 E. 42nd St., New York 17, N. Y.
Arcee Products, Pawtucket, R. I.
Arco Co., The, 7301 Bessemer Ave., Cleveland 27, O.
Arcos Corp., 1500 S. 50th St., Philadelphia 43, Pa.
Arens Controls, Inc., 2017 Greenleaf St., Evanston, Ill.
Arex Co., 612 N. Michigan Ave., Chicago 11, Ill.
Argo Sales, 436 Capitol Ave., Hartford, Conn.
Arjac Products Inc., 55-59 Halstead St., Rochester 10, N. Y.
Armart Mfg. Co., 103 Hawthorne Ave., Pittsfield, Mass.
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Armco Steel Corp., 703 Curtis St., Middletown, Ohio.
Armite Laboratories, 6609 Broad St., Los Angeles 1, Calif.
Armour and Co., Ammonia Div., 1355 W. 31st St., Chicago 9, Ill.
Armstrong Bros. Tool Co., 5200-5300 W. Armstrong Ave., Chicago 30.
Armstrong Co., The, 241 S. Post St., Detroit 17, Mich.
Armstrong Co., Richard M., Westchester, Pa.
Armstrong Cork Co., 4400 Concord St., Lancaster, Pa.
Armstrong Furnace Co., 851 W. 3rd Ave., Columbus, O.
Armstrong Machine Wks., 874 Maple St., Three Rivers, Mich.
Arro Expansion Bolt Co., N. Boone Ave., Marion, O.
Arrow-Hart & Hegeman Elect. Co., 103 Hawthorne St., Hartford 6, Conn.
Arrowhead Rubber Co., 2300 Curry St., Long Beach, Calif.
Art Valve Co., 4662 N. Lincoln Ave., Chicago 25, Ill.
Asbestos Asphalt Insulation Co., 2100 W. Fullerton Ave., Chicago 47.
Ashburn Supply Co., 8468 Warner Dr., Culver City, Calif.
Ashcraft Co., J. P., 5643 Dyer St., Dallas 6, Tex.
Ashton Valve Co., 43 Kendrick St., Wrentham, Mass.
Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Associated Plastics Co's., Inc., Midland, Mich.
Associated Valve & Engineering Co., 1150 W. Marquette Rd., Chicago, Ill.
Aston Products, Inc., 22804 Dequindre, Hazel Park, Mich.
Atkins Saw Div., Borg-Warner Corp., 402 S. Illinois St., Indianapolis 9, Ind.
Atkomatic Valve Co., Inc., 545 W. Abbott St., Indianapolis 25, Ind.
Atlantic Metal Hose Co., Inc., 308 Dyckman St., New York 34, N. Y.
Atlantic Pipe Bending & Fabricating Corp., Route 17 near Moonachie Ave., P. O. Box 157, Wood-Ridge, N. J.
Atlantic Steel Boiler Co., S. E. Cor. 22nd & Washington Ave., Philadelphia 46, Pa.
Atlantic Steel Co., P. O. Box 1714, Atlanta 1, Ga.
Atlas Mfg. Co., Eustis at Robbins St., St. Paul 14, Minn.
Atlas Mineral Products Co., Mertztown, Pa.
Atlas Powder Co., Industrial Finishes Dept., North Chicago, Ill.
Atlas Valve Co., 282 South St., Newark, N. J.
Atlas Welding Accessories Co., 707 E. Lewiston Ave., Ferndale 20, Mich.
Atmos Corp., 1215 West Fullerton Ave., Chicago 14, Ill.
Auburn Burner Co., Lock Box 269, Auburn, Ind.
Auburn Foundry Inc., Stoker Div., Auburn, Ind.
Auburn Machine Works, Inc., Auburn, Neb.
Auburn Sparkplug Co., Inc., Auburn, N. Y.
Auer Register Co., 6600 Clement Ave., Cleveland 5, O.
Aurora Pump Co., 619 Loucks St., Aurora, Ill.
Austin Corp., Robert, 51 Albany St., Boston 11, Mass.
Austin Engineering & Mfg. Co., Inc., 8935 San Jose Rd., Ysleta (El Paso County), Texas
Au-Temp-Co Corp., 657 Broadway, New York 12, N. Y.
Autoclave Engineers, Inc., 846 E. 19th St., Erie, Pa.
Automatic Burner Corp., 1823 W. Carroll Ave., Chicago 12, Ill.
Automatic Control Co., 995 University Ave., St. Paul 4, Minn.
Automatic Devices Co., Inc., 714 Hillgrove Ave,. Western Springs, Ill.
Automatic Electric Mfg. Co., 10 State St., Mankato, Minn.
Automatic Firing Corp., 4417 Oleatha Ave., St. Louis 16, Mo.
Automatic Gas Equipment Co., 301 Brushton Ave., Pittsburgh 21, Pa.
Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Autorad Inc., 3535 Fillmore St., Chicago 24, Ill.
Autostributor Co., 226 Leslie St., Lansing 12, Mich.
Auto-Therm Mfg. Co., 6400 E. Seven Mile, Detroit 34, Mich.
Avon Tube Div., Higbe Mfg. Co., Ewing Rd., Rochester, Mich.
Ayres, Inc., 1017 Rosine St., Houston, Tex.

B

Babbitt Chemical Co., 36 Prospect St., New Bedford, Mass.
Babbitt Steam Specialty Co., 1 Babbitt Sq., New Bedford, Mass.
Babcock & Wilcox Co., 161 E. 42nd St., New York 17, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Babcock & Wilcox Co., Tubular Products Div., Keystone Plant, Alliance, O.
Bacharach Industrial Instrument Co., 7301 Penn Ave., Pittsburgh 8.
Badger Fire Extinguisher Co., 624 Somerville Ave., Somerville 43, Mass.

Badger Mfg. Co., 230 Bent St., Cambridge 41, Mass.
Badger Sales Co., Inc., 2251 W. Pico Blvd., Los Angeles 6, Calif.
Badham Insulation Co., Inc., 1909 — 1st Ave. S., Birmingham, Ala.
Bahnson Co., 1001 S. Marshall St., Winston-Salem 1, N. C.
Bailey Co., Chas. M., 667 Folsom St., San Francisco 7, Calif.
Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, O.
Bakelite Co., Div. of Union Carbide & Carbon Chemical Corp., 30 E. 42nd St., New York, N. Y.
Baker Co., Inc., Maplewood, Me.
Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
Bal-Air, Inc., 1210 McGarock St., Nashville, Tenn.
Baldor Electric Co., 4353 Duncan Ave., St. Louis 10, Mo.
Baldwin-Hill Co., 500 Breunig Ave., Trenton 2, N. J.
Baldwin Ward Mfg. Co., 1630 S. Main, Ottawa, Ks.
Balloffet Nozzle Co., Inc., 6825 Adams St., Guttenberg, N. J.
Baltimore Aircoil Co., Inc., 2615-2635 Mathews St., Baltimore 18, Md.
Banister Co., Inc., 25 Charles St., Cambridge 41, Mass.
Barber-Colman Co., 1300 Rock St., Rockford, Ill.
Barber Mfg. Co., 3704 Superior Ave., Cleveland 14, O.
Bar-Brook Mfg. Co., Inc., 6133 Linwood Ave., Shreveport, La.
Barclay, Inc., Robert, 1236 W. Fulton St., Chicago 7, Ill.
Barco Mfg. Co., 500 Hough St., Barrington, Ill.
Bard Mfg. Co., Bryan, O.
Barkow Mfg. Co., Inc., Aug. G., 2230 South 43rd St., Milwaukee 46.
Barksdale Valves, 5125 Alcoa Ave., Los Angeles 58, Calif.
Barnebey-Cheney Co., Cassady at East 8th Ave., Columbus 19, O.
Barnes & Jones, Inc., 128 Brookside Ave., Jamaica Plain, Boston 36
Barnes Manufacturing Co., Mansfield, O.
Barnes Tool Co., The, 152 Brewery St., New Haven 6, Conn.
Barreled Sunlight Paint Co., 43 Dudley St., Providence 1, R. I.
Barrett Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
Barrett Haentjens & Co., Hazleton, Pa.
Barrett Machine Co., 912-916 Behan St., N. S., Pittsburgh 12, Pa.
Barrows Porcelain Enamel Corp., Langdon Farm Rd. & Pa. R. R., Cincinnati, O.
Barry Blower Co., 3100 California St., N.E., Minneapolis, Minn.
Barry Controls, Inc., 765 Pleasant St., Watertown 72, Mass.
Bart Mfg. Corp., 227 Main St., Belleville 9, N. J.
Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit 2, Mich.
Barton Instrument Corp., 1429 S. Eastern Ave., Los Angeles 22, Calif
Barton Products, Inc., 819 N. Blanchard, Wheaton, Ill.
Barwick Mfg. Corp., 317 E. 18th, Wichita, Kan.
Baseline Mfg. Co., 2701 E. 78th St., Minneapolis 23, Minn.
Basic Engineers, 1834 Main St., Pittsburgh, Pa.
Basic Refractories, Inc., 845 Hanna Bldg., Cleveland 15, O.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bate Soot Blower Div., General Blower Co., Inc., 6412 Girard Ave., Philadelphia 31, Pa.
Bath Co., Cyril, The, 32400 Aurora Rd., Solon, O.
Bausch & Lomb Optical Co., 633 St. Paul St., Rochester 2, N. Y.
Bayer Co., 4030 Chouteau Ave., St. Louis 10, Mo.
Bayley Blower Co., 6600 W. Burnham St., Milwaukee 14, Wis.
Beach-Russ Co., 50 Church St., New York 7, N. Y.
Beacon-Morris Corp., 60 Brainerd Rd., Allston, Boston 34, Mass.
Beaird Co., J. B., 6200 St. Vincent Ave., Shreveport, La.
Bear Mfg. Co., Industrial Div., 2030 5th Ave., Rock Island, Ill.
Bearing Co. of America, Federal Mogul Corp., 501 Harrisburg Ave., Lancaster, Pa.
Beaton & Cadwell Mfg. Co., 185 Main St., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Beaver Advance Corp., Ellwood City, Pa.
Beaver Pipe Tools, Inc., 310 Dana Ave., Warren, O.
Beckett & Co., Inc., Thomas, 2521 Willowbrook Rd., P. O. Box 13,245, Dallas 9, Tex.
Beckett Corp., R. W., Elyria, O.
Beckley Perforating Co., 301 North Ave., Garwood, N. J.
Beckman & Whitley, Inc., 985 San Carlos Ave., San Carlos, Calif.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., 100 Pennsylvania Ave., Paterson 3, N. J.
Belco Industries, Inc., 3830-32 Olive St., St. Louis 8, Mo.
Belknap Mfg. Co., Div. of Detroit Controls, 800 Union Ave., Bridgeport 1, Conn.
Bell & Gossett Co., 8200 N. Austin Ave., Morton Grove, Ill.
Belmont Packing & Rubber Co., The, Butler & Sepviva Sts., Philadelphia 37, Pa.
Belmont Smelting & Refining Wks., Inc., 349 Belmont Ave., Brooklyn 7, N. Y.
Beltran Associates, Inc., 1133 East 35th St., Brooklyn 10, N. Y.
Benjamin Air Rifle Co., 1527 S. 8th St., St. Louis 4, Mo.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Benson Co., Inc., Alex R., 1040 Bay Rd., So., Hudson, N. Y.
Benson, R. C., Pennsauken 8, N. J.
Bergen Pipesupport Corp., 50 Church St., New York 7, N. Y.
Berger Bros. Co., 229-237 Arch St., Philadelphia 6, Pa.
Berger Div., Republic Steel Corp., 1038 Belden Ave., Canton 5, O.
Berkeley Pump Co., 829 Bancroft Way, Berkeley, Calif.
Berko Electric Mfg. Co., 212-40 Jamaica Ave., Queens Village 28, N. Y.
Berna Co., A. J., 20160 Sherwood, Detroit, Mich.
Bernz Co., Otto, 280 Lyell Ave., Rochester 6, N. Y.
Berry-Hill Corp., Hill Diesel Engine Div., 1 Washington Ave., Providence, R. I.
Bertram Co., Harvey P., The, 561 Reading Rd., Cincinnati 2, O.
Bertsch & Co., Inc., Church St., Cambridge City, Ind.
Besser Metal Products Corp., 754 Clement Ave., Charlotte, N. C.
Best Combustion Equipment Co., Inc., W. N., 415 11th St., Carlstadt, N. J.
Bete Fog Nozzle Inc., 309 Wells St., Greenfield, Mass.
Bethlehem Steel Co., Bethlehem, Pa.
Betz Corp., 445 State St., Hammond, Ind.
Beverly Shear Mfg. Co., 3019 W. 111th St., Chicago 43, Ill.
Bica Co., 1170 N. State St., Girard, O.
Biersach & Niedermeyer Co., 1937 N. Hubbard St., Milwaukee 12.
Bigelow Co., The, 174 River St., New Haven 3, Conn.
Bigelow Liptak Corp., 2550 W. Grand Blvd., Detroit 8, Mich.
Biggs Boiler Wks. Co., The, 1007 Bank St., E. Akron 5, O.
Biglin & Co., Inc., H. C., 177 Harris, Atlanta, Ga.
Bignall & Keeler Div., John Ramming Machine Co., 4591 McRee Ave., St. Louis 10, Mo.
Billings & Spencer Co., 1 Laurel St., Hartford 1, Conn.
Binks Mfg. Co., 3114-40 Carroll Ave., Chicago 12, Ill.
Birchfield Boiler, Inc., 2503 E. 11th St., Tacoma 1, Wash.
Bird-Archer Co., 4337 North American St., Philadelphia 40, Pa.
Birdsell Mfg. Co., Inc., 750 San Antonio Rd., Palo Alto, Calif.
Birks Mfg. Co., 811 Hanover Rd., Meriden, Conn.
Bishop & Babcock Mfg. Co., 4901 Hamilton Ave., Cleveland 14, O.
Black & Decker Mfg. Co., The, 628 Pennsylvania Ave., Towson 4, Md.
Black Mfg. Co., The, 201 Second St., Harrison, N. J.
Black, Sivalls & Bryson, Inc., 7500 E. 12th St., Kansas City 26, Mo.
Black & White Chemical Co., 130 Walnut Ave., New York 54, N. Y.
Blackhawk Mfg. Co., 5325 W. Rogers St., Milwaukee 1, Wis.
Blackmer Pump Co., 1809 Century Ave., S. W., Grand Rapids 9.
Blaw Knox Co., Buflovak Equipment Div., 50 Winchester Ave., Buffalo 11, N. Y.
Blaw Knox Co., Power Piping and Sprinkler Div., 829 Beaver Ave., Pittsburgh 33, Pa.
Blazer, M., & Son, 173 Market St., Passaic, N. J.
Blissfield Mfg. Co., Blissfield, Mich.
Blokolgas System, Inc., 70 W. Alexandrine, Detroit 1, Mich.
Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich.
Blossom Mfg. Co., Inc., 915 Broadway, New York 10, N. Y.
Blower Application Co., 3165 N. 30th St., Milwaukee 16, Wis.
Blue Ridge Talc Co., Inc., Henry, Va.
Blue Seal Chemical Co., 177 Westfield Ave., W., Roselle Park, N. J.
Bluffton Electric Co., Bluffton, Ind.
Bock Corp., 110 S. Dickinson St., Madison, Wis.
Bodine Electric Co., 2254 W. Ohio St., Chicago 12, Ill.
Boiler Engineering & Supply Co., Manavon Rd., Phoenixville, Pa.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Bonair Products, Inc., 517 Ellis St., Darby, Pa.
Bonney Forge & Tool Wks., 715 Meadow St., Allentown, Pa.
Bordo Co., Inc., L. J., 115 New St., Glenside, Pa.
Borin Mfg. Co., 23 N. Union St., Elgin, Ill.
Boston Auto Gage Co., 70 West St., Pittsfield, Mass.
Boston Gear Works, Quincy 71, Mass.
Boston Machine Works Co., 7 Willow St., Lynn, Mass.
Boston Woven Hose & Rubber Co., 29 Hampshire St., Cambridge
Botfield Refractories Co., Swanson & Clymer Sts., Philadelphia 47, Pa.
Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
Bowen Engineering, Inc., North Branch, N. J.
Bowerston Shale Co., The, P.O. Box 2, Bowerston, O.
Bowman Co., D. F., 315 W. Main St., New Albany, Ind.
Boylston Steam Specialty Co., 116-122 W. Illinois St., Chicago, Ill.
Brabender Corp., Rochelle Park, N. J.
Brady Co., W. H., 727 W. Glendale Ave., Milwaukee 12, Wis.
Brandes Co., 2046 Winnebago, Madison, Wis.
Brandt & Co., Inc., Eugene J., 847 11th Ave., New York 19, N. Y.
Brass & Copper Imports, Inc., 220 Broadway, New York 38, N. Y.
Breeze Corporations, Inc., Union, N. J.
Breidert Co., G. C., P. O. Box 1190, San Fernando, Calif.
Bremil Mfg. Co., 1020 Holland St., Erie, Pa.
Bressler Engineering Service, Oregon, Ill.
Bridgeport Brass Co., 30 Grand St., Bridgeport 2, Conn.
Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., Connecticut Ave., Bridgeport 1, Conn.
Bristol Co., The, P. O. Box 1790, Waterbury 20, Conn.
Broan Mfg. Co., Inc., 1669 N. Water St., Milwaukee 2, Wis.
Bronson Fan Mfg. Corp., 4578 Worth St., Los Angeles, Calif.
Bronze Bearings, Inc., 340 North Ave., E. Cranford, N. J.
Brook Motor Corp., 3555 W. Peterson Ave., Chicago 45, Ill.
Brooke Engineering Co., Inc., 4517 Wayne Ave., Philadelphia 44, Pa.
Brookfield Engineering Laboratories, Inc., 240 Cushing St., Stoughton, Mass.
Brooklyn Varnish Mfg. Co., 50 Jay St., Brooklyn 1, N. Y.
Brooks Equipment Corp., 217 Hudson St., Hoboken, N. J.
Brooks Rotameter Co., Lansdale, Pa.
Brookside Products Co., Inc., McCordsville, Ind.
Bros Boiler & Mfg. Co., Wm., 1057 10th Ave., S. E., Minneapolis 14
Brown Co., 150 Causeway St., Boston, Mass.
Brown-Brockmeyer Co., Inc., P. O. Box 989, Dayton 1, O.
Brown-Electro Co., 17 N. Dewey, Oklahoma City 2, Okla.
Brown Fintube Co., The, Elyria, O.
Brown Products Co., 97-12 Metropolitan Ave., Forest Hills, N. Y.
Browning Mfg. Co., 1940 Browning Blvd., Maysville, Ky.
Brundage Co., The, 503 N. Park St., Kalamazoo 11, Mich.
Bruner Corp., 4763 N. 32nd St., Milwaukee, Wis.
Bruning Co., Inc., Charles, 4700 Montrose Ave., Chicago 41, Ill.
Brunner Co., The, Rt. 129, Athens Rd., Gainesville, Ga.
Brunner Mfg. Co., 1821 Broad St., Utica 1, N. Y.
Bryan Steam Corp., P. O. Box 337, Peru, Ind.
Bryant, Div. of Carrier Corp., 48 Monument Circle, Indianapolis 4, Ind.
Bubar Dust Systems, Old Lyme, Conn.
Buckeye Furnace Pipe Co., The, 897 Ingleside, Columbus 8, O.
Buckeye Tools Corp., 5005 Springboro Pike, Dayton 9, O.
Buda Div., The, Allis-Chalmers Mfg. Co., Harvey, Ill.
Buell Engineering Co., 70 Pine St., New York 5, N. Y.
Buensod-Stacey, Inc., 60 E. 42nd St., New York 17, N. Y.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Buffalo Forge Co., 171 Mortimer St., Buffalo 5, N. Y.
Buffalo Meter Co., 2917 Main St., Buffalo 14, N. Y.

Buffalo Pumps, Inc., Div. of Buffalo Forge Co., 171 Mortimer St., Buffalo 5, N. Y.
Buffalo Tank Corp., South Ave., Dunellen, N. J.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., 381 Harris Ave., Providence 1, R. I.
Bullard Co., The, Canfield Ave., Bridgeport 2, Conn.
Bump Pump Co., La Crosse, Wis.
Bundy Tubing Co., 8109 E. Jefferson Ave., Detroit 14, Mich.
Burden Co., Alan E., 1940 Pontius Ave., Los Angeles 34, Calif.
Burdett Mfg. Co., 3433 W. Madison St., Chicago 24, Ill.
Burdett Oxygen Co. of Calif., 2014 Belgrave Ave., Huntington Park, Calif.
Burgess-Manning Co., Architectural Products Div., 5970 Northwest Highway, Chicago 31, Ill.
Burgess-Thomas Co., 17 James St., Bloomfield, N. J.
Burke Electric Co., Div. of Marathon Electric Mfg. Corp., 1201 W. 12th St., Erie, Pa.
Burkhart Engineering Associates, Inc., 30 Huntington Ave., Boston.
Burling Instrument Co., Air Conditioning Div., 16 River Rd., Chatham, N. J.
Burnham Corp., Main St., Irvington, N. Y.
Burrows Mfg. Co., F. A., 318 E. Poplar St., York, Pa.
Burt Mfg. Co., 41 E. South St., Akron 11, O.
Bury Compressor Co., 18th & Cascade Sts., Erie, Pa.
Bush Mfg. Co., 179 South St., West Hartford 10, Conn.
Buxton Mfg. Co., Dover, N. J.
By-Buk Co., 4314 West Pico Blvd., Los Angeles 14, Calif.
Byers Co., A. M., Clark Bldg., Pittsburgh 22, Pa.
Byron Jackson Div., Borg-Warner Corp., P. O. Box 2017, Terminal Annex, Los Angeles 54.

C

C C Pump Mfg. Div., Market-Madison Sts., Palmyra, N. J.
CCA Products, Inc., P. O. Box 671, Glendale 5, Calif.
C & H Air Conditioning Fan Co., Inc., 1603 DeKalb Ave., N. E., Atlanta 6, Ga.
Cabot, Inc., Samuel, 141 Milk St., Boston 9, Mass.
Calbar Paint & Varnish Co., 2612-26 N. Martha St., Philadelphia 25.
Calculator Specialties Co., 122 S. Michigan Ave., Chicago 3, Ill.
Caldwell Co., W. E., 2120 Brook St., Louisville, Ky.
Calgon, Inc., Hagan Bldg., Pittsburgh 30, Pa.
California Brass Mfg. Co., 1447 Naud St., Los Angeles 12, Calif.
California Steel Products Div., Barrett Ave. & A St., Richmond, Calif.
Cambridge Filter Corp., 738 Erie E. Blvd., Syracuse 3, N. Y.
Camco Products Inc., 445 State St., North Haven, Conn.
Cameron Iron Works, Inc., P. O. Box 1212, Houston, Tex.
Camloc Fastener Corp., 22 Spring Valley Rd., Paramus, N. J.
Campbell Co., E. K., Manchester at 18th, Kansas City 26, Mo.
Campbell Co., J. A., 645 E. Wardlaw Rd., Long Beach 7, Calif.
Campbell Heating Co., 3121 Dean Ave., Des Moines 17, Ia.
Campco Div., Chicago Molded Products Corp., 2717 N. Normandy Ave., Chicago, Ill.
Cam-Stat, Inc., Div. of The Paul Henry Co., 11833 West Olympic Blvd., Los Angeles 64, Calif.
Cannon Chemical Co., Inc., 181 Portland St., Cambridge 41, Mass.
Canton Stoker Corp., 2400 Andrew Place, S. W., Canton 1, O.
Canvas Products Co., 2115 Locust St., St. Louis 3, Mo.
Capewell Mfg. Co., 60 Governor St., Hartford 2, Conn.
Capitol Mfg. & Supply Co., 153 W. Fulton St., Columbus, O.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Carboline Co., The, 331 Thornton Ave., St. Louis 19, Mo.
Carboloy Dept. of General Electric Co., 11177 E. 8 Mile Rd., Detroit.
Cardox Corp., 307 N. Michigan Ave., Chicago, Ill.
Carey Electronic Engineering Co., Metal Wool Div., 1880 Clifton Ave., Springfield, O.
Carey Mfg. Company, Philip, Wayne Ave., Lockland, Cincinnati 15, O.
Cargocaire Engineering Corp., 15 Park Row, New York 38, N. Y.
Carlen Associates, 40 West 57th St., New York, N. Y.
Carlin Co., The, Wethersfield, Conn.
Carling Turbine Blower Co., 25 St. John's Rd., Worcester 3, Mass.
Carlon Products Corp., 10225 Meech Ave., Cleveland 5, O.
Carlson & Sullivan, 1617 California St., Monrovia, Calif.
Carnes, Inc., John R., Greenlawn Ave. & Erie R. R., Lima, O.
Carnes Corp., Verona, Wis.
Carney Co., Inc., The, Mankato, Minn.
Carolina Aniline & Extract Co., 301 S. Cedar St., Charlotte, N. C.
Carolina Blower Co., Inc., 428-436 Morehead Ave., Greensboro, N. C.
Carpenter Heating & Stoker Co., 2135 St. Clair Ave., Cleveland 14, O.
Carpenter Monolithic Floating Floor Co., Suite 9, 1560 Ansel Rd., Cleveland 6, O
Carpenter & Paterson, Inc., 18 Hurley St., Cambridge 41, Mass.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Carpenter Valve Corp., The, 6723 Denison Ave., Cleveland 2, O.
Carrier Corp., 300 S. Geddes St., Syracuse 1, N. Y.
Carty & Moore Engineering Co., 1150 W. Baltimore Ave., Detroit 2, Mich.
Carvell Heat Equipment Co., 1217 Temple St., Los Angeles 26, Calif.
Carver Pump Co., 1460 Hershey Ave., Muscatine, Ia.
Cash Co., A. W., P. O. Box 551, Decatur, Ill.
Cash Valve Mfg. Corp., A. W., 6621 E. Wabash Ave., Decatur, Ill.
Cashin Co., W. D., 69 A. St., Boston 27, Mass.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Cauhorn Distributing Co., 20722 W. Seven Mile, Detroit 19, Mich.
Celanese Corp. of America, 180 Madison Ave., New York 16, N. Y.
Celotex Corp., The, 120 S. La Salle St., Chicago 3, Ill.
Cement Lined Pipe Co., 93 Brookline St., Lynn, Mass.
Central Die Casting & Mfg. Co., Inc., 2935 W. 47th St., Chicago, Ill.
Central Foundry Co., Murray & Pacific Sts., Newark 5, N. J.
Central States Steel Boiler Co., 4649 W. Harrison St., Chicago 44, Ill.
Central Station Steam Co., 2920 E. Woodridge St., Detroit 7, Mich.
Central Steel & Wire Co., P. O. Box 5610-A, Chicago 80, Ill.
Central Transformer Corp., Pine Bluff, Ark.
Central Wire & Iron Works, 621 E. Locust St., Des Moines, Ia.
Centrifix Corp., 3608 Payne Ave., Cleveland 14, O.
Centri-Spray Corp., 39001 Schoolcraft Rd., Livonia, Mich.
Century Electric Co., 1806 Pine St., St. Louis 3, Mo.
Century Engineering Corp., 401-431 3rd St., S. E., Cedar Rapids, Ia.
Century Fan & Ventilator Co., 41 Cedar St., Stamford, Conn.
Century Instrument Co., 565 East Milwaukee St., Detroit, Mich.
Certified Furnace Corp., P. O. Box 1059, Trenton 8, N. J.
Chace Co., W. M., 1606 Beard Ave., Detroit 9, Mich.
Chain Belt Co., 4617 W. Greenfield, Milwaukee 1, Wis.
Chamberlin Co. of America, 1254 La Brosse St., Detroit 32, Mich.
Champion Blower & Forge Co., Harrisburg Ave., and Charlotte St., Lancaster, Pa.
Champion Furnace Pipe Co., 215 Eaton St., Peoria 3, Ill.
Champion Machine & Forging Co., 3695 E. 78th St., Cleveland 5, O.
Chaplin-Fulton Mfg. Co., 5800 Grand Ave., Pittsburgh 25, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Char-Gale Mfg. Co., 4325 Hiawatha Ave., Minneapolis 6, Minn.
Chase Brass & Copper Co., 236 Grand St., Waterbury 20, Conn.
Chelsea Fan & Blower Co., Inc., 639 South Ave., Plainfield, N. J.
Chelsea Metal Stamping Co., 95 8th Ave., New York 11, N. Y.
Chelsea Products, Inc., 639 South Ave., Plainfield, N. J.
Chemical Coatings & Engineering Co., West Chester Pike, Edgemont, Pa.
Chemical Engineering Co., 2800 Logan St., P. O. Box 1076, Dallas 1.
Chemical Solvent Co., 3005 N. 16th St., Birmingham, Ala.
Chempump Corp., 1300 E. Mermaid Lane, Philadelphia 18, Pa.
Chemurgic Process Corp., 55 West 42nd St., New York, N. Y.
Cheney Flashing Co., 623 Prospect St., Trenton 5, N. J.
Chesapeake & Ohio Railway Co., Terminal Tower, Cleveland 1, O.
Chesflex Corp., 684 Nepperhan Ave., Yonkers, N. Y.
Chester Cable Corp., Chester, N. Y.
Chesterton Co., A. W., 6 Ashland St., Everett 49, Mass.
Chicago Belting Div., Chicago-Allis Mfg. Corp., 113-125 N. Green St., Chicago 7, Ill.
Chicago Blower Corp., 9867 Pacific Ave., Franklin Park, Ill.
Chicago Bridge & Iron Co., 332 S. Michigan Ave., Chicago 4, Ill.
Chicago Die Casting Mfg. Co., 2510-14 W. Monroe St., Chicago 12, Ill.
Chicago Expansion Bolt Co., 1338 W. Concord Pl., Chicago 22, Ill.
Chicago Float Works, Not Inc., Dept. T., 2330 S. Western Ave., Chicago 8, Ill.
Chicago Forging and Mfg. Co., 2000 Southport Ave., Chicago 14, Ill.
Chicago Gasket Co., 1271 West North Ave., Chicago 22, Ill.
Chicago Metal Mfg. Co., 3724 S. Rockwell St., Chicago 32, Ill.
Chicago Nipple Mfg. Co., 1616 S. Laramie Ave., Cicero 50, Ill.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., 622 Diversey Pkwy., Chicago 14, Ill.
Chicago Specialty Mfg. Co., 2954 Lawrence Ave., Chicago 25, Ill.
Chicago Steel Furnace Company, 9326 S. Anthony Ave., Chicago 17, Ill.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc. 6400 W. 66th, Chicago 38, Ill.
Chicago-Wilcox Mfg. Co., 7701 Avalon Ave., Chicago, Ill.
Chiksan Co., Brea, Calif.
Childers Mfg. Co., 3620 W. 11th St., Houston 8, Tex.
Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., 1600 Webster St., Dayton 1, O.
Cincinnati Electrical Tool Co., The, 2684 Madison Rd., Cincinnati 8, O.
Cincinnati Metalcrafts Inc., 5000 Brotherton Rd., Cincinnati 9, O.
Cincinnati Shaper Co., Hopple, Garrard and Elam, Cincinnati 25, O.
Circle-Air Industries, Inc., 244 Herkimer St., Brooklyn 16, N. Y.
Circle Clamp Corp., 39 Broadway, New York 6, N. Y.
Circle Seal Precision Valves, 2181 E. Foothill Blvd., Pasadena 8, Calif.
Cissell Mfg. Co., W. M., 831 First St., P. O. Box 1143, Louisville 1, Ky.
Clarage Fan Co, Porter St., Kalamazoo 16, Mich.
Clark Bros. Bolt Co., Milldale, Conn.
Clark Bros. Co., Inc., Div. of Dresser Industries, 600 Lincoln St., Orlean, N. Y.
Clark Controller Co., 1146 E. 152nd St., Cleveland 10, O.
Clark Dust Control Co., 210 N. Mozart St., Chicago, Ill.
Clark Mfg. Co., 1830 E. 38th St., Cleveland 14, O.
Claronex Products, Inc., 239 Java St., Brooklyn 22, N. Y.
Clauss Cutlery Co., Fremont, O.
Cla-Val Co., 17th & Placentia, Newport Beach, Calif.
Clay Equipment Corp., Cedar Falls, Ia.
Clayton & Lambert Mfg. Co., 1701 Dixie Hwy., Louisville 10, Ky.
Clayton Mfg. Co., 401 N. Temple City, El Monte, Calif.
Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis.
Cleveland Brass Mfg. Co., The, 4606 Hamilton Ave., Cleveland, O.
Cleveland Crane & Eng. Co., 5866 E. 289th St., Wickliffe, O.
Cleveland Fuel Equipment Co., 1111 Brookpark Rd., Cleveland 9, O.
Cleveland Graphite Bronze Co., 17000 St. Clair Ave., Cleveland 10, O.
Cleveland Heater Co., 2310 Superior Ave., Cleveland 14, O.
Cleveland Humidifier Co., 7802 Wade Park Ave., Cleveland 3, O.
Cleveland Punch & Shear Works Co., E. 40th and St. Clair Ave., Cleveland 14, O.
Cleveland Worm & Gear Co., 3249 E. 80th St., Cleveland 4, O.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., 152 Grove St., Waltham 54, Mass.
Climax Metal Products Co., 863 E. 140 St., Cleveland 10, O.
Clime-Matic Corp., Connecticut & Richards Ave., South Norwalk, Conn.
Clinton Metallic Paint Co., Clinton, N. Y.
Clipper Mfg. Co., 65 E. 28th St., Kansas City 8, Mo.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Clock & Timer Dept., General Electric Co., Homer Ave., Ashland, Mass.
Clow & Sons, James B., 201-299 N. Talman Ave., Chicago 12, Ill.

Clyde Tube Forgings Co. of America, Inc., Foot of S. W. Gibbs St., Portland 1, Ore.
Cobell Industries, P. O. Box 1157, Ft. Worth, Tex.
Cobra Metal Hose Div., 4640 W. 54th St., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Brook St., P. O. Box 176, Elmwood 10, Conn.
Cochrane Corp., 3131 N. 17th St., Philadelphia 32, Pa.
Coe Mfg. Co., Bank St., Painesville, O.
Coen Co., 40 Boardman Pl., San Francisco 3, Calif.
Coffin Co., J. S., Jr., 326 S. Dean St., Englewood, N. J.
Coffing Hoist Div., Duff-Norton Co., Danville, Ill.
Cole-Sewell Engineering Co., 2288 University Ave., St. Paul 4, Minn.
Coleman Co., Inc., The, 250 N. St. Francis St., Wichita 1, Ks.
Colonial Plastics Mfg. Co., 8007 Grand Ave., Cleveland 4, O.
Color-Art Printing & Stationery Co., 201 South Kirkwood, Kirkwood 22, Mo.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Columbia Engineering Service Co., 4025 Sebastopol Hiway, Santa Rosa, Calif.
Columbia-Geneva Steel Div., United States Steel Corp., Russ Bldg., 235 Montgomery St., San Francisco 6, Calif.
Columbian Steel Tank Co., 1509 W. 12th St., Kansas City 7, Mo.
Columbus Steam Pump Wks. Co., 724 W. Gay St., Columbus 8, O.
Combustion Engineering Inc., 200 Madison Ave., New York 16, N. Y.
Combustion Equipment Co., 1202 15th St., Moline, Ill.
Comfort Products Corp., 440 Hillburn Dr., Dallas 2, Tex.
Commercial Filters Corp., 2 Main St., Melrose 76, Mass.
Commercial Plastics Co., 2812 W. North Ave., Chicago 47, Ill.
Commercial Shearing & Stamping Co., 1775 Logan, P. O. Box 719, Youngstown 1, O.
Commercialaire, Inc., 300 Pacific St., Brooklyn 1, N. Y.
Committee on Steel Pipe Research, American Iron and Steel Institute, 350 Fifth Ave., New York 1, N. Y.
Commonwealth Brass Corp., 5781-5835 Commonwealth Ave., Detroit 8, Mich.
Conco Engineering Works, Div. of H. D. Conkey & Co., Mendota, Ill.
Condensation Engineering Corp., 3511 W. Potomac Ave., Chicago 31.
Condenser Service & Engineering Co., Inc., 150 Observer Highway, Hoboken, N. J.
Congress Drives Div., Tann Corp., 3750 E. Outer Drive, Detroit 34, Mich.
Conneaut Plastic Metallic Packing Co., Conneaut, O.
Connor Engineering Corp., Danbury, Conn.
Conoflow Corp., Dept. P, 2100 Arch St., Philadelphia 3, Pa.
Consolidated Metal Products Corp., Albany, N. Y.
Continental Air Filters, Inc., Box 1647, Louisville 1, Ky.
Continental Can Co., Millsplastic Pipe Div., 100 E. 42nd St., New York 17, N. Y.
Continental-Diamond Fibre, Newark, Del.
Continental Electric Co., Inc., 323 Ferry St., Newark, N. J.
Continental Machine Co., 1952-54 Maud Ave., Chicago 14, Ill.
Continental Products Co., 1150 E. 222nd St., Euclid 17, O.
Continental Radiant Glass Heating Corp., 1 E. 35th St., New York 16.
Continental Rubber Wks., 1935 Liberty St., Erie, Pa.
Continental Screw Co., Mt. Pleasant St., New Bedford, Mass.
Continental Steel Corp., 1108 S. Main St., Kokomo, Ind.
Contour Marker Corp., 1843½ E. Compton Blvd., Compton 2, Calif.
Controlair Mfg. Co., 1932 S. Compton Ave., Los Angeles, Calif.
Control Engineering Corp., Controls Div., 934 Washington St., Norwood, Mass.
Convector Corp. of America, 52 Canal St., Washington, D. C.
Convector Manufacturers Ass'n., 2159 Guardian Bldg., Detroit 26, Mich.
Cook Co., Loren, 664 Front St., Berea, O.
Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Coolerator Co., New Garrick Bldg., Duluth, Minn.
Cool-Ette, Inc., 20080 James Couzens Hwy., Detroit 35, Mich.
Cooper Alloy Corp., Bloy St. & Ramsey Ave., Hillside, N. J.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Cooper Hewitt Electric Co., 72-732 Grand St., Hoboken, N. J.
Copeland Refrigeration Corp., Sidney, O.
Copes-Vulcan Div., Continental Foundry & Machine Co., 939 West 26th St., Erie 4, Pa.
Coppus Engineering Corp., 344 Park Ave., Worcester 2, Mass.
Coral Designs, Div. of Henry G. Dietz Co., 12-16 Astoria Blvd., Long Island City 2, N. Y.
Corbman Bros., Inc., 25th & York St., Philadelphia, Pa.
Cordo Chemical Corp., 34 Smith St., Norwalk, Conn.
Corite Products, Inc., 4224 S. Lowe Ave., Chicago 9, Ill.
Corley Co., Inc., The, Plainville, Conn.
Corley Co., Inc., The, One Exchange Place, Jersey City 2, N. J.
Corning Glass Works, Corning, N. Y.
Cornish-Rutland Co., Rutland, Vt.
Corrosion Control Co., Inc., 516 Fifth Ave., New York 36, N. Y.
Corrosite Div., Reliance Paint Co., 64 So. 6th St., Brooklyn, N. Y.
Corro-Vent, Inc., 510 Mercantile Library Bldg., Cincinnati 2, O.
C-O Two Fire Equipment Co., Newark, N. J.
Coughlan Co., G. N., West Orange, N. J.
Couplings Co., 2205 W. Roosevelt Rd., Chicago 8, Ill.
Cox Mfg. Co., Ridgeville, Ind.
Cramer Co., R. W., Centerbrook, Conn.
Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.
Crane Packing Co., 1872 Cuyler Ave., Chicago 13, Ill.
CraneVeyor Corp., 1240 S. Boyle Ave., Los Angeles 23, Calif.
Crawford Co., 3220 W. 31st St., Chicago 23, Ill.
Crawford Fitting Co., 884 East 140th St., Cleveland 10, O.
Crescent Plastics, Inc., 955 Diamond Ave., Evansville, Ind.
Crescent Tool Co., 230 Harrison St., Jamestown, N. Y.
Croll-Reynolds Engineering Co., Inc., 17 John St., New York 38, N. Y.
Croll & Son, Jesse G., 2326-2606 Germantown Ave., Philadelphia, Pa.
Crosby Steam Gage & Valve Co., 43 Kendrick St., Wrentham, Mass.
Crotty Mfg. Corp., 133-15 35th Ave., Flushing, L. I., N. Y.
Crown Controls Co., Inc., 40-44 S. Washington St., New Bremen, O.
Crown Die & Tool Corp., 108 N. Jefferson St., Chicago 6, Ill.
Crown Engineer Corp., Locust St., Keyport, N. J.
Crucible Steel Co. of America, Oliver Bldg., P. O. Box 88, Pittsburgh 30, Pa.
Cryer Trap & Valve Div., Encor Corp., 28 Joralemon St., Belleville, N. J.
Crystalheat Co., Van Nuys, Calif.
Culligan Inc., Northbrook, Ill.
Cuno Engineering Corp., 78 S. Vine St., Meriden, Conn.
Curtis Mfg. Co., Refrigeration Div., 1950 Kienlen Ave., St. Louis 20, Mo.
Custom Engineering Co., 406 S. Main St., Los Angeles 13, Calif.
Custom Mfg. Co., 4105 W. Fullerton Ave., Chicago 39, Ill.
Cutler-Hammer, Inc., 421 N. 12th St., Milwaukee 1, Wis.
Cybertronic Corp. of America, Third & Morton Aves., Chester, Pa.
Cyclotherm Div., National-U. S. Radiator Corp., 157 E. First St., Oswego, N. Y.

D

Daffin Mfg. Co., Lancaster, Pa.
Dahl, G. W., 430 High St., Bristol, R. I.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering Inc., 628 Somerville Ave., Somerville 43, Mass.
Dalmo-Victor Co., San Carlos, Calif.
Dalzen Mfg. Co., 525 South Riverside, St. Clair, Mich.
Damascus Tube Co., Greenville, Pa.
Dampney Co. of America, 50 Business St., Hyde Park, Boston, Mass.
Dana Fan & Blower Corp., 3501-27 Colerain Ave., Cincinnati 23, O.
Darcoid Co., Inc., 145 Sixth Ave., New York 13, N. Y.
Darling Valve & Mfg. Co., 701 First St., Williamsport, Pa.
Dart Union Co., 134 Thurbers Ave., Providence 5, R. I.
Das Div. of The Zeller Corp., Fort Wayne Rd., Defiance, O.
Davey Compressor Co., Kent, O.
Davidson Co., M. T., 7 Dey St., New York 7, N. Y.
Davidson Hyduty Roof Fan Co., 213 California St., Newton, Mass.
Davis Engineering Corp., 1070 E. Grand St., Elizabeth 4, N. J.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., 201 Halleck St., Newark 4, N. J.
Davis Regulator Co., 2546 S. Washtenaw Ave., Chicago 8, Ill.
Davison Chemical Co., Div. of W. R. Grace & Co., 101 N. Charles St., Baltimore 3, Md.
Day Co., The, 810-830 Third Ave., N. E., Minneapolis 13, Minn.
Day & Night Div., Affiliated Gas Equipment, Inc., 700 Royal Oaks Dr., Monrovia, Calif.
Dayton Automatic Stoker Co., 30 Deeds, Dayton, O.
Dayton Electric Mfg. Co., 126 S. Oakley Blvd., Chicago 12, Ill.
Dayton Rogers Mfg. Co., 2824 13th Ave. S., Minneapolis 7, Minn.
Dayton Rubber Co., 2342 W. Riverview Ave., Dayton 1, O.
Daytronic Corp., 216 S. Main St., Dayton 2, O.
Dean Brothers Pumps, Inc., 323 W. 10th St., Indianapolis 7, Ind.
Dean Hill Pump Co., 4000 E. 16th St., Indianapolis 7, Ind.
Deansteel Products Co., 111 Merchants St., San Antonio, Tex.
Dearborn Chemical Co., Merchandise Mart Plaza, Chicago 54, Ill.
Dearborn Stove Co., 1700 W. Commerce St., P. O. Box 5527, Dallas 2, Tex.
Dearborn Tape & Label Co., P. O. Box 4119, N. E. Station, Dearborn, Mich.
Debevoise Co., The, 74-84 20th St., Brooklyn 32, N. Y.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Decatur Pump Co., 2750 Nelson Park Rd., Decatur, Ill.
Deepfreeze Appliance Div., Motor Products Corp., North Chicago, Ill.
Deering Air Conditioning Co., The, 1069 Celestial St., Cincinnati 2, Ohio.
Defender Instrument & Regulator Co., 815 Clark Ave., St. Louis 4, Mo.
De Laval Steam Turbine Co., 871 Nottingham Way, Trenton 2, N. J.
Delavan Mfg. Co., 811 Fourth Ave., West Des Moines, Ia.
Delco Appliance Div., General Motors Corp., P. O. Box 230, Rochester 1, N. Y.
Delco Products Div., General Motors Corp., 329 E. First St., Dayton 1, O.
Delta Heating Corp., Cole St. & Reading R. R., Trenton 8, N. J.
Delta Welder Corp., 8525 Livernois, Detroit 4, Mich.
Deltron, Inc., 2905 Leithgow St., Philadelphia, Pa.
Deming Co., 14 Aetna St., Salem, O.
Demuth & Sons, Inc., Charles, 245 Elm Place, Mineola, L. I., N. Y.
Denbo Engineering & Sales Co., Inc., 3301 Martindale Ave., Indianapolis.
Dersch, Gesswein & Neuert, Inc., 4849 W. Grand Ave., Chicago 39, Ill.
Desmond-Stephan Mfg. Co., Urbana, O.
Desomatic Products, Inc., 1109 W. Broad St., Falls Church, Va.
d'Este Div., Kaye & MacDonald, Inc., 11-15 Central Ave., West Orange, N. J.
De-Tec-Tronic Corp., 2512 N. Halsted St., Chicago, Ill.
Detroit Brass & Malleable Co., 100 S. Campbell, Detroit 9, Mich.
Detroit Controls Corp., 5900 Trumball Ave., Detroit 8, Mich.
Detroit Deisel Engine Div., General Motors Corp., 13400 W. Outer Dr., Detroit 28, Mich.
Detroit Hoist & Machine Co., 8200 Morrow St., Detroit 11, Mich.
Detroit Stamping Co., 350 Midland Ave., Detroit 3, Mich.
Detroit Stoker Co., Fifth Floor, General Motors Bldg., Detroit 2, Mich.
Deutsch Co., The, 7000 Avalon Blvd., Los Angeles 3, Calif.
Devco Engineering, Inc., Passaic Ave. & Pier Lane, Caldwell, N. J.
Devices, Inc., A Div. of Miracle Adhesives Corp., 214 E. 53 St., New York 22, N. Y.
DeVilbiss Co., The, 300 Phillips Ave., Toledo 1. O.
Devine Mfg. Co., Inc., J. P., 49th and A.V.R.R., Pittsburgh 1, Pa.
De Zurik Shower Co., Sartell, Minn.
Diamond Expansion Bolt Co., Inc., 500 North Ave., Garwood, N. J.
Diamond Machine Tool Co., 5111 Coffman-Pico Rd., Pico, Calif.
Diamond Mfg. Co., 253 W. Eighth St., Wyoming, Pa.
Diamond Power Specialty Corp., P. O. Box 415, Lancaster, O.
Diceler Div. of General Machine & Mfg. Co., Blair St. and Spring

Garden Ave., Berwick, Pa.
Dickson Co., The, 7420 Woodlawn Ave., Chicago 19, Ill.
Diehl Mfg. Co., Finderne Plant, 1106 Finderne Ave., Somerville, N. J.
Dielectric Products Co., Inc., 125 Virginia Ave., Jersey City 5, N. J.
Diesel Oil Burner Corp. of New York, 105-20 New York Blvd., Jamaica, Long Island, N. Y.
Dietzgen Co., Eugene, 2425 Sheffield Ave., Chicago 14, Ill.
Dillon & Co., Inc., W. C., 14620 Keswick St., Van Nuys, Calif.
Dillon Steam Boiler Wks., Inc., D. M., Crocker St., Fitchburg, Mass.
Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 46.
Division Lead Co., 7742 W. 61st Pl., Summit, Ill.
Dixon Crucible Co., Joseph, Wayne & Monmouth Sts., Jersey City 3, N. J.
DoAll Co., The, 254 N. Laurel Ave., Des Plaines, Ill.
Dockson Corp., 3839 Wabash Ave., Detroit 8, Mich.
Dockstader, Inc., S. E., 1128 Munsey Bldg., Washington 4, D. C.
Dodge Mfg Corp., 500 S. Union St., Mishawaka, Ind.
Doerr Electric Corp., 508 N. 4th St., Cedarburg, Wis.
Dole Refrigerating Co., 5910 N. Pulaski, Chicago 30, Ill.
Dole Valve Co., The, 1933 Carroll Ave., Chicago 12, Ill.
Dollinger Corp., 9 Centre Park, Rochester 3, N. Y.
Domestic Mfg. Corp., P. O. Box 252, Bellaire, Texas
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Donaldson Div., Marvin D. Shafer Co., Inc., 2915 Knox Ave., Los Angeles 39, Calif.
Donaldson Power Ventilator Co., 11847 Vose St., N. Hollywood, Calif.
Dormeyer Industries, 3418 Milwaukee Ave., Chicago 41, Ill.
Dover Mfg. Co., Box 498, Independence, Mo.
Dow Chemical Co., The, Midland, Mich.
Dow Corning Corp., Midland, Mich.
Dowell, Inc., P. O. Box 536, Tulsa 1, Okla.
Downing Steel Products, 4005 Smithville Rd., Dayton 9, O.
Downingtown Iron Works, Wallace Ave., Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Foot of 23rd St., Brooklyn 32, N. Y.
Doyle Vacuum Cleaner Co., 225 Stevens St., S. W., Grand Rapids 2, Mich.
Drage Products, Inc., 406 32nd St., Union City, N. J.
Dravo Corp., Machinery Div., Dravo Bldg., Pittsburgh 22, Pa.
Drayer-Hanson, Inc., Subsidiary of National-U. S. Radiator Corp., Box 2215, Terminal Annex, Los Angeles 54, Calif.
Dreier Brothers Inc., 5642 Lake Park Ave., Chicago 37, Ill.
Dreis & Krump Mfg. Co., 7404 Loomis Blvd., Chicago 36, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., 49 Fisher Ave., Bradford, Pa.
Drew & Co., Inc., E. F., 13 E. 26th St., New York, N. Y.
Drico Industrial Corp., 100 8th St., Passaic, N. J.
Driv-Way Lite Co., P. O. Box 2850, Denver, Colo.
Drying Systems, Inc., 1812½ W. Foster Ave., Chicago 40, Ill.
Dryomatic Corp., 812 N. Fairfax St., P. O. Box 334, Alexandria, Va.
Dual-Air Fan Co., P. O. Box 208, Hampshire, Ill.
Ducon Co., The, 147 E. 2nd St., Mineola, N. Y.
Dudgeon, Inc., Richard, 789 Bergen St., Brooklyn 38, N. Y.
Dunham Co., C. A., 400 W. Madison St., Chicago 6, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Duo-Therm Div., Motor Wheel Corp., Lansing 3, Mich.
du Pont de Nemours & Co., E. I., Electrochemicals Dept., Wilmington 98, Del.
du Pont de Nemours & Co., E. I. Finishes Div., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington 98, Del.
du Pont de Nemours & Co., Inc., E. I., "Kinetic" Chemicals Div., 10th and Market Sts., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Photo Products Dept., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Polychemicals Dept., Wilmington 98, Del
Durabla Mfg. Co., 114 Liberty St., New York 6, N. Y.
Duraloy Co., Scottdale, Pa.
Durant Insulated Pipe Co., Warren Way & Bay Rd., Palo Alto, Calif.
Durant International Corp., Williamstown, N. J.
Durez Plastics Div., Hooker Electrochemical Co., 1950 Walck Rd., North Tonawanda, N. Y.
Duriron Co., Inc., The, 450 N. Findlay St., Dayton 1, O.
Durkee-Atwood Co., 215 N. E. 7th St., Minneapolis, Minn.
Duro Co., 537 Monument Ave., Dayton, O.
Duro-Dyne Corp., 800 Third Ave., New Hyde Park, Long Island, N. Y.
Duro Metal Products Co., 2649 N. Kildare Ave, Chicago, Ill.
Dust Filter Co., 134 S. La Salle St., Chicago 3, Ill.
Dust Suppression & Engineering Co., P. O. Box 67, Lake Orion, Mich.
Dustex Corp., 1758 Walden Ave., Buffalo 25, N. Y.
Dutton Boiler Div., Hapman-Dutton Co., 623 Gibson St., Kalamazoo 6, Mich.
DuVerre, Inc., P. O. Box 97, Hamburg, N. Y.
Dwyer Mfg. Co., F. W., P. O. Box 373, Michigan City, Ind.
Dynamic Air Engineering, Inc., 7412 Maie Ave., Los Angeles 1, Calif.

E

Eagan Co., Inc., Walter H., 2336-38 Fairmount Ave., Philadelphia 30
Eagle Chemical Co., Inc., 1501 W. Congress St., Chicago 7, Ill.
Eagle Picher Co., American Bldg., Cincinnati 1, O.
Eastern Industries Inc., 100 Skiff St., Hamden 14, Conn.
Eastern Stainless Steel Corp., P. O. Box 1975, Baltimore 3, Md.
Eastman Kodak Co., 343 State St., Rochester 4, N. Y.
Easton Plastic Products Co., Inc., 900 Line St., Easton, Pa.
Eaton Mfg. Co., 9771 French Rd., Detroit 13, Mich.
Ebco Mfg. Co., 265 N. Hamilton Rd., Columbus 13, O.
Ebert Electronics Corp., 212-26 Jamaica Ave., Queens Village 28, N. Y.
Eckhart Mfg. Co., Inc., 831 Lehigh Ave., Union, N. J.
Eclipse Fuel Engineering Co., 1139 Buchanan St., Rockford, Ill.
Eco Engineering Co., 12 New York Ave., Newark 1, N. J.
Econo Products Company Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Economy Pumps, Inc., Div. of Wheeler Mfg. Co., C. H., 19th & Lehigh, Philadelphia 32, Pa.
Economy Valve Seat Co., 1436 N. Keating, Chicago 51, Ill.
Eddington Metal Specialty Co., P. O. Box K, Eddington, Pa.
Eddy Valve Co., Waterford, N. Y.
Edge Moor Iron Wks., Inc., Edge Moor 25, Del.
Edison, Inc., Thomas A., Instrument Div., 60 Lakeside Ave., West Orange, N. J.
Eds-Wil Burner Corp., 2656 Diversey Ave., Chicago 47, Ill.
Edward Valves, Inc., 1200 W. 145th St., East Chicago, Ind.
Edwards, L. V., 32 Irving Place, Rockville Center, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Eisler Engineering Co., Inc., 750 S. 13th St., Newark 3, N. J.
Ejay Baseboard Mfg. Co., 124 Boyd St., Winsted, Conn.
Elastic Porcelain Lining Corp., 221 Norris Dr., Rochester 10, N. Y.
Elco Tool & Screw Corp., 1800 Broadway, Rockford, Ill.
Electric Arc, Inc., 152 Jelliff Ave., Newark 8, N. J.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo 1, O.
Electric Controller & Mfg. Co., 4526 Lee Rd., Cleveland 28, O.
Electric Furnace-Man, Inc., Emmaus, Pa.
Electric Hose & Rubber Co., Wilmington, Del.
Electric Machinery Mfg. Co., 800 Central Ave., Minneapolis 13, Minn.
Electric Motor Corp., Div. of Howard Industries, Inc., Racine, Wis.
Electric Motors & Specialties, Inc., King & Hamsher Sts., Garrett, Ind.
Electric Products Co., 1725 Clarkstone Rd., Cleveland, O.
Electric Steel Foundry Co., 2141 N. W. 25th St., Portland 10, Ore.
Electriglas Corp., Bergenfield, N. J.
Electrimatic Co., Sales Affiliate, Jas. P. Marsh Corp., 3501 Howard St., Skokie, Ill.
Electro-Air Cleaner Co., 1285 Reedsdale St., Pittsburgh 33, Pa.
Electro Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Electro Mfg. Co., 2903 Whitney, Houston, Tex.
Electro Rust-Proofing Corp., 30 Main St., Belleville, N. J.
Electrol Burner Mfg. Co., Inc., 22 Union Ave., Rutherford, N. J.
Electromode Corp., 45 Crouch St., Rochester 3, N. Y.
Electronics Corp. of America, 77 Broadway, Cambridge 42, Mass.
Electro-Switch & Controls Inc., 5755 Camille Ave., Culver City, Calif.
Electro-Therm, Inc., 931 Selim Rd., Silver Spring, Md.
Electrovent Fan & Mfg. Co., 812 W. Lake St., Chicago 7, Ill.
Elgen Mfg. Co., 41-34 39th St., Long Island City 4, N. Y.
Elgin Softener Corp., Elgin, Ill.
Elgo Shutter & Mfg. Co., 2738 W. Warren Ave., Detroit 8, Mich.
Elliott Co., Jeannette, Pa.
Ellis & Watts Products, Inc., P. O. Box 33, Cincinnati 36, O.
Ellison Draft Gage Co., 548 W. Monroe St., Chicago, Ill.
Elraco Engineering Co., 732 W. 58th St., Los Angeles, 37, Calif.
Elvee Co., Box 237, Melrose 76, Mass.
Embassy Steel Products, Inc., 890 Stanley Ave., Brooklyn 8, N. Y.
Emco Pneumatic Corp., 1317 Locust St., Des Moines, Ia.
Emerson Electric Mfg. Co., The, 8100 Florissant Ave., St. Louis 21.
Emerson Radio and Phonograph Corp., 14th & Coles St., Jersey City, N. J.
Emjay Maintenance Engineers, 327 Union Ave., Rutherford, N. J.
Empire Chemical Products Co., 10 Longworth St., Newark, N. J.
Empire Ventilation Equipment Co., 35-39 Vernon Blvd., Long Island City, N. Y.
Enderle, Inc., Ltd., Frank X., 1715 San Fernando Rd., Los Angeles 65, Calif.
Engelhard, Inc., Charles, 850 Passaic Ave., East Newark, N. J.
Engineer Co., 75 West St., New York 6, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., 18th & Florida Sts., San Francisco 10, Calif.
Equipment Engineering Co., 2853 Columbus Ave., Minneapolis, Minn.
Erdle Perforating Co., 171 York St., Rochester 11, N. Y.
Ergolyte Mfg. Co., 3627 Lawrence St., N., Philadelphia 40, Pa.
Erickson Specialty Co., 10 Cayuga St., P. O. Box 141, Cohoes, N. Y.
Erie Bolt & Nut Co., Erie, Pa.
Erie City Iron Wks., 1450 East Ave., Erie, Pa.
Erie Tool Wks., 735 W. 12th St., Erie, Pa.
Ernst Water Column & Gauge Co., Livingston, N. J.
Ess Instrument Co., 96 S. Washington Ave., Bergenfield, N. J.
Essex Wire Corp., 1601 Wall Street, Ft. Wayne 6, Ind.
Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif.
Eutectic Welding Alloys Corp., 172 St. & Northern Blvd., Flushing 58, N. Y.
Evans Corp., The, George River Drive at 37th St., Moline, Ill.
Evans Machine Co., Inc., 122 S. Calverton Rd., Baltimore, Md.
Even-Ray Co., Inc., 93 Tiffany Blvd., Newark 4, N. J.
Eveready Briksaw Co., 1509 S. Michigan Blvd., Chicago 5, Ill.
Everite Pump & Mfg. Corp., W. Roseville Rd., Lancaster, Pa.
Everlasting Valve Co., 49 Fisk St., Jersey City 5, N. J.
Everwarm, Inc., 2925 N. Central Ave., Knoxville, Tenn.
Excelsior Leather Washer Mfg. Co., 720-730 Chestnut St., Rockford, Ill.
Excelsior Steel Furnace Co., The, 118 S. Clinton St., Chicago 6, Ill.
Excelsior Tool & Machine Co., 31st & Ridge Ave., East St. Louis, Ill.
Extruded Plastics, Inc., New Canaan Ave., Norwalk, Conn.

F

Faber Engineering Co., Inc., Amber & Westmoreland Sts., Philadelphia 34, Pa.
Fabri-Valve Co. of America, 2100 N. Albina, Portland, Ore.
Fafnir Bearing Co., The, 37 Booth St., New Britain, Conn.
Fageol Co., R.D., Heat Machine Div., P. O. Box 328, Kent, O.

Fairbanks Co., The, 393 Lafayette St., New York 3, N. Y.
Fairbanks Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.
Fairmont Aluminum Co., Fairmont, W. Va.
Fairmont Tool & Forging, 10611 Quincy Ave., Cleveland 6, O.
Falcon Equipment Co., 13th St., New Brighton, Pa.
Falk Corp., 3010 W. Canal St., Milwaukee 8, Wis.
Falstrom Co., 26 Falstrom Court, Passaic, N. J.
Famco Machine Co., 3114 Sheridan Rd., Kenosha, Wis.
Fanner Mfg. Co., The, Brookside Park, Cleveland 9, O.
Farr Company, P. O. Box 45187 Airport Station, Los Angeles 45, Calif.
Farrar & Treits, Div. of ADSCO Industries, 20 Milburn St., Buffalo 12, N. Y.
Farrell Associates, Charles, Valencia, Pa.
Farris Engineering Corp., 400 Commercial Ave., Palisades Park, N. J.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fasco Industries, Inc., P. O. Box 509, Rochester 2, N. Y.
Fedders-Quigan Corp., 57 Tonawanda St., Buffalo 7, N. Y.
Fedders-Quigan Corp., Heating Div., P. O. Box 1690, Trenton 7, N. J.
Federal-Mogul Corp., 11031 Shoemaker St., Detroit 13, Mich.
Federal Oil Burner Co., Inc., 3620 Walnut St., Philadelphia 4, Pa.
Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Felt Products Mfg. Co., 1504 Carroll Ave., Chicago 7, Ill.
Felters Company, The, 210 South St., Boston 11, Mass.
Fennelly Co., J. C., 1485 Bayshore Blvd., San Francisco, Calif.
Fenwal Inc., 130 Pleasant St., Ashland, Mass.
Fenway Machine Co., 263 N. 23rd St., Philadelphia, Pa.
Ferguson & Lange Foundry Co., 1039 Willow St., Chicago, Ill.
Fern, Ralph, 1007 Fisk St., Scranton 9, Pa.
Ferro Corp., 4150 East 56th St., Cleveland 5, O.
Ferro Electric Products, Inc., Kirkland, Ill.
Fibercast Corp., 100 S. Lincoln, Sand Spring, Okla.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. 4th St., Philadelphia 33, Pa.
Filt-R-Ite Co., 1408 W. Harrison St., Chicago 7, Ill.
Filtrine Mfg. Co., Inc., 63 Wanamaker Ave., Waldwick, N. J.
Finn & Company, Inc., T. R., 200 Central Ave., Hawthorne, N. J.
Finnigan & Co., Inc., J. J., 722 Marietta, N. W., Atlanta, Ga.
Fire Gun Sales Corp., 2500 W. 7th St., Denver 4, Colo.
Fireline Stove & Furnace Lining Co., 1800 Kingsbury St., Chicago 14.
Firestone Plastics Co., Pottstown, Pa.
Fischer & Porter Co., 600 Warminster Rd., Hatboro, Pa.
Fisher Governor Co., 205 S. First Ave., Marshalltown, Ia.
Fisher Research Laboratory, Inc., 1961 University Ave., Palo Alto, Calif.
Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York 17, N. Y.
Flagg & Co., Inc., Stanley G., #3 Penn Center Plaza, Philadelphia 2, Pa.
Flanders Mill, Inc., Riverhead, Long Island, N. Y.
Flemm Lead Co., Inc., Bradley Ave., & School St., Long Island City, 1, N. Y.
Flex-Air Inc., 4273 S. Broadway, Los Angeles 73, Calif.
Flexaust Co., 100 Park Ave., New York 17, N. Y.
Flexible Metal Hose Mfg. Co., 777 West 16th St., Costa Mesa, Calif.
Flexible Tubing Corp., Guilford, Conn.
Flexitallic Gasket Co., 918 N. 8th St., Camden 2, N. J.
Flexlock Corp., 218 Gougler Ave., Kent, O.
Flexo Supply Co., Inc., 4649 Page Blvd., St. Louis 13, Mo.
Flexonics Corp., 1391 S. Third Ave., Maywood, Ill.
Flexrock Co., 36 & Filbert Sts., Philadelphia 4, Pa.
Flintkote Co., The, 30 Rockefeller Plaza, New York 20, N. Y.
Flodar Corp., 1342 E. 45th St., Cleveland 3, O.
Flori Pipe Co., The, 5700 Bulwer, St. Louis 15, Mo.
Floridin Co., P. O. Box 998, Tallahassee, Fla.
Flow Corp., 283 Concord Ave., Cambridge 38, Mass.
Fluid Heat Div., Anchor Post Products, Inc., 6500 Eastern Ave., Baltimore 24, Md.
Fluid Systems, Inc., 1881 Dixwell Ave., New Haven 14, Conn.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., 12000 E. Washington Blvd., Whittier, Calif.
Fluxolder Co., 511 W. Larned, Detroit, Mich.
Flynn & Emrich Co., 301 Holliday St., Baltimore 2, Md.
Formica Co., 4614 Spring Ave., Cincinnati, O.
Forney Engineering Co., 2705 Hawes St., Dallas 9, Tex.
Forston Co., 1400 Conti Ave., Houston, Texas.
Ft. Worth Steel & Machinery Co., P. O. Box 1038, Ft. Worth, Tex.
Forty-Eight Insulations, Inc., P. O. Box 472, Aurora, Ill.
Foster Co., Benjamin, 4635 W. Girard Ave., Philadelphia 31, Pa.
Foster Engineering Co., 835 Lehigh St., Union, N. J.
Foster Pump Wks., Inc., 46-A Washington St., Brooklyn 1, N. Y.
Foster Wheeler Corp., 165 Broadway, New York 6, N. Y.
Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Foxboro Co., 106 Neponset Ave., Foxboro, Mass.
Fram Corp., Providence 16, R. I.
France Refractories Co., J. H., 1921 France Rd., Snow Shoe, Pa.
Franklin Balmar Corp., Woodberry, Baltimore 11, Md.
Franklin Dales Co., 180-184 E. Mill St., Akron, O.
Franklin Electric Co., Inc., 400 E. Spring St., Bluffton, Ind.
Franklin Plastics, Inc., Franklin, Pa.
Frederick Iron & Steel Inc., E. 7th St., Frederick, Md.
Freeman Heating Div., Illinois Iron & Bolt Co., Carpentersville, Ill.
Fresh'nd-Aire Co., Div. of Cory Corp., 221 N. LaSalle St., Chicago 1.
Fretz-Moon Tube Co., Inc., P. O. Box 551, Butler, Pa.
Frick Co., Waynesboro, Pa.
Fricke, Fred J., 4404 Avenida Estrellita, Albuquerque, N. M.
Friedrich Refrigerators, Inc., 1117 E. Commerce, San Antonio, Tex.
Friermood Machine Works, Converse, Ind.
Friez Instrument Div., Bendix Aviation Corp., Taylor Ave., Towson, Baltimore 4, Md.
Frigid, Inc., 128 32nd St., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton 1, O.
Frontier Bronze Corp., Packard Rd., Niagara Falls, N. Y.
Fuel Reduction Corp., 220 N. Ada St., Chicago 7, Ill.
Fuelguard Co., 5643 Dyer St., Dallas 6, Tex.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Fuller Co., 124 Bridge St., Catasauqua, Pa.
Fuller Co., D. William, 2320 E. 75th St., Chicago 49, Ill.
Fuller Co. of Calif., H. B., 1060 Howard, San Francisco, Calif.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Box 400, Knoxville 1, Tenn.
Furnas Electric Co., 1041 McKee St., Batavia, Ill.

G

G & H Mfg. Co., 3047 Amber St., Philadelphia 34, Pa.
G. M. Mfg. Co., 50 W. 3rd St., New York 12, N. Y.
G & O Mfg. Co., 138 Winchester Ave., New Haven 8, Conn.
Gabriel Boiler & Fabrication Co., 1428 N.W. 14th Ave., Portland, Ore.
Gaines-Collins, Quijada Tool Division, 5474-78 Alhambra Ave., Los Angeles 32, Calif.
Gallaher Co., The, 4108 Dodge St., Omaha 3, Neb.
Gannon Co., Inc., Russell R., The, 5037 Beech St., Cincinnati 12, O.
Garden City Fan Co., 332 S. Michigan Ave., Chicago 4, Ill.
Garden City Instruments, Inc., 608 S. Dearborn St., Chicago 5, Ill.
Gardiner Metal Co., 2514 W. 48th Pl., Chicago 32, Ill.
Gardner-Denver Co., Quincy, Ill.
Garlock Packing Co., 50 Main St., Palmyra, N. Y.
Garman Co., Inc., The, 1253 Grover Rd., St. Louis 23, Mo.
Gas & Oil Industry Laboratories, Inc., 4 Paine Ave., Irvington, N. J.
Gasoilair Equipment Co., P. O. Box 768, New Haven, Conn.
Gates Engineering Co., P. O. Box 1711, Wilmington, Del.
Gates Rubber Co., The, 999 S. Broadway, Denver 17, Colo.
Gateway Engineering Co., 3233 W. Grand Ave., Chicago, Ill.
Gatke Corp., 228 N. LaSalle St., Chicago 1, Ill.
Gehri Co., 1117 Tacoma Ave., Tacoma 3, Wash.
Gel-Me Co., P. O. Box 293, Bloomington, Ill.
Gen-A-Matic Corp., 14741 Bessemer St., Van Nuys, Calif.
General Air Conditioning Corp., 4542 E. Dunham St., Los Angeles, Calif.
General Automatic Products Corp., 2300 Sinclair Lane, Baltimore 13, Md.
General Blower Co., 8610 Ferris Ave., Morton Grove, Ill.
General Ceramics Corp., Crows Mill Road, Keasbey, N. J.
General Chemical Div., Allied Chemical & Dye Corp., 40 Rector St., New York, N. Y.
General Controls Co., 801 Allen Ave., Glendale 1, Calif. and Skokie, Ill.
General Electric Co., Air Conditioning Div., 5 Lawrence St., Bloomfield, N. J.
General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, N. Y.
General Electric Co., Capacitor Dept., Hudson Falls, N. Y.
General Electric Co., Chemical and Metallurgical Div., 1 Plastics Ave., Pittsfield, Mass.
General Electric Co., Commercial & Industrial Air Conditioning Dept., 5 Lawrence St., Bloomfield, N. J.
General Electric Co., Construction Materials Div., 1285 Boston Ave., Bridgeport 2, Conn.
General Electric Co., Lamp Div., Nela Park, Cleveland 12, O.
General Electric Co., Major Appliance Div., 301 W. Liberty St., Louisville 2, Ky.
General Filter Co., 923 Second St., Ames, Ia.
General Filters, Inc., 43800 Grand River, Novi, Mich.
General Fittings Co., P. O. Box 151, East Greenwich, R. I.
General Gas Light Co., 202 N. Park, Kalamazoo 11F, Mich.
General Heaters & Regulators Co., 4801 Railroad Ave., East Chicago, Ind.
General Paint Corp., 2627 Army St., P. O. Box 3474, San Francisco.
General Plate Div., Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
General Register Corp., 14 Factory St., Cedar Grove, N. J.
General Scientific Equipment Co., 27th & Huntingdon Sts., Philadelphia 32, Pa.
General Tire & Rubber Co., 444 Tacoma Ave., Logansport, Ind.
General Tire & Rubber Co., 1708 Englewood, Akron, O.
General Tire & Rubber Co., Industrial Products Div., Wabash, Ind.
Geneva Mfg. Co., 430 Stevens St., Geneva, Ill.
Genie-Air, 4352 S. Broadway, Los Angeles, Calif.
Gerett Corp., M. A., 724 W. Winnebago St., Milwaukee 5, Wis.
Germatrol Corp., 622 Brookline Blvd., Pittsburgh 26, Pa.
Gerrard & Co., A. J., 1950 Hawthorne Ave., Melrose Park, Ill.
Gerstein & Cooper Inc., 1 W. 3rd St., South Boston, Mass.
Gerwin Industries, Inc., 214 Spring St., Michigan City, Ind.
Giannini & Co., Inc., G. M., 918 E. Green St., Pasadena, Calif.
Giant Mfg. Co., 6th St. & 12th Ave., Council Bluffs, Ia.
Gibson Industries, Inc., 965 W. Western Ave., Muskegon, Mich.
Gibson Refrigerator Co., Greenville, Mich.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilbert Brass Foundry Co., 5028 Farlin St., St. Louis, Mo.
Gilbreth Co., The, 1211 Chestnut St., Philadelphia 7, Pa.
Gisholt Machine Co., 1253 E. Washington Ave., Madison 10, Wis.
Glidden Co., The, Berea Rd. & Madison St., Cleveland, O.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Goder Incinerator Corp., 407 S. Dearborn St., Chicago 5, Ill.
Goethel Sheet Metal Wks., Inc., Alfred, 3218 W. Fond du Lac Ave., Milwaukee 10, Wis.
Golden Anderson Valve Specialty Co., 1232 Ridge Ave., Pittsburgh 33.
Goldens' Foundry & Machine Co., Columbus, Ga.
Goodall Rubber Co., 441 Whitehead Rd., Trenton, N. J.

Goodfellow Co.. Inc., E. D., 496 E. Bodley Ave., Memphis, Tenn.
Goodrich Co., B. F., 548 S. Main St., Akron 18, O.
Goodrich Chemical Co., B. F., Rose Bldg., Cleveland, O.
Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, O.
Goodwill Mfg. Co., 1213 S. Laramie, Chicago 50, Ill.
Gordon & Piatt, Inc., P. O. Box 914, Winfield, Kan.
Gorman-Rupp Industries, Inc., Belleville, O.
Gorton Heating Corp., Cranford, N. J.
Goss Gas Inc., 5209 Baum Blvd., Pittsburgh 24, Pa.
Gould Co., J. D., 730 E. Washington St., Indianapolis, Ind.
Goulds Pumps, Inc., Fall St., Seneca Falls, N. Y.
Governair Corp., 513 N. Blackwelder St., Oklahoma City 4, Okla.
Grabler Mfg. Co., 6565 Broadway, Cleveland 5, O.
Graham Mfg. Co., Inc., 415 Lexington Ave., New York 17, N. Y.
Graham Mfg. Corp., 31465 Stephenson Highway, Royal Oak 4, Mich.
Graham Transmissions. Inc., Menomonee Falls, Wis.
Granberg Corp., 1308 67th St., Oakland 8, Calif.
Granite City Steel Co., 20th & Madison Ave., Granite City, Ill.
Grant Wilson Inc., 141 W. Jackson Blvd., Suite 1560, Chicago, Ill.
Graphic Calculator Co., 633 Plymouth Ct., Chicago 5, Ill.
Graphic Indicator Co., 1739 S. La Cienega Blvd., Los Angeles 35, Calif.
Graton & Knight Co., 356 Franklin St., Worcester 4, Mass.
Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.
Gray Co., Inc., 51 Graco Square, Minneapolis 13, Minn.
Gray Metal Products, Inc., 30 Carleton St., Rochester, N. Y.
Gray Tool Co., P. O. Box 2291, Houston, Tex.
Great Northern Mfg. Corp., 1056 N. Wood St., Chicago 22, Ill.
Great Western Steel Co., 2300 West 58th, Chicago, Ill.
Green Fire Brick Co., A. P., Mexico, Mo.
Green Fuel Economizer Co., 780 Main St., Beacon, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Greenfield Tap & Die Corp., Sanderson St., Greenfield, Mass.
Greenheck Bros. Mfg. Co., Schofield, Wis.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., 2136 12th St., Rockford, Ill.
Greenwood Valve Div. of Vernon Tool Co., Ltd., 1101 Meridian Ave., Alhambra, Calif.
Greer Hydraulics, Inc., International Airport, Jamaica 30, N. Y.
Griffin & Co., 500 Bergman Ave., Louisville 8, Ky.
Griffith Equipment Co., Inc., 4503 Alger St., Los Angeles 39, Calif.
Grinnell Co., Inc., 260 W. Exchange St., Providence 1, R. I.
Grip Nut Co., 310 S. Michigan Ave., Chicago, Ill.
Griscom-Russell Co., The, Massillon, O.
Gross-Aire Mfg. Co., 9416 W. Milton Ave., Overland 14, Mo.
Grove Valve and Regulator Co., 65th & Hollis St., Oakland, Calif.
Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago 12, Ill.
Guardian Products Corp., 1215 E. 2nd St., Michigan City, Ind.
Gulf Oil Corp., P. O. Box 1166, Gulf Bldg., Pittsburgh 30, Pa.
Gustin-Bacon Mfg. Co., 210 W. 10th St., Kansas City 6, Mo.

H

H. A. Mfg. Co., 1612 W. King St., York, Pa.
H-B Instrument Co., American & Bristol Sts., Philadelphia 40, Pa.
H & H Tube & Mfg. Co., 245-275 N. Forman Ave., Detroit 17, Mich.
H P Products, Inc., Louisville, O.
Haering & Co., Inc., D. W., P. O. Box 6037, Harlandale Sta., San Antonio, Tex.
Haertel Co, Walter, 2840 4th Ave., S., Minneapolis, Minn.
Hagan Corp., Hagan Bldg., Pittsburgh 30, Pa.
Hager Bros., East P. O. Box 1511, Rockford, Ill.
Hague & Co., Inc., Alfred, 230 Thirty-fourth St., Brooklyn 32, N. Y.
Haines Div., Wm. S., Sellers Injector Corp., 1600 Hamilton St., Philadelphia 30, Pa.
Hall Laboratories, Inc., 323 Fourth Ave., Pittsburgh 30, Pa.
Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22, Pa.
Hamburg Boiler Wks., Inc., Grand St., Hamburg, Pa.
Hamer Valves, Inc., 2919 Gardenia Ave., Long Beach 6, Calif.
Hamilton Div., Baldwin-Lima-Hamilton Corp., Hamilton, O.
Hamilton Rubber Mfg. Corp., Box 361, Trenton 3, N. J.
Hammel-Dahl Co., 175 Post Rd., (Warwick), Providence 5, R. I.
Hammett Electric Mfg. Co., 209 W. 19th Terrace, Kansas City 8, Mo.
Hammond Brass Wks., Summer Blvd., Hammond, Ind.
Hampton-Cross Co., The, 120 S. 10th St., Louisville 2, Ky.
Handy & Harman, 82 Fulton St., New York 38, N. Y.
Haney Gas Burner & Engineers, Inc., 909 So. Myrtle Ave., P. O. Box 147, Monrovia, Calif.
Hanna Engineering Wks., 1765 N. Elston, Chicago 22, Ill.
Hanovia Chemical & Mfg. Co., 100 Chestnut St., Newark 5, N. J.
Hansen Mfg. Co., Inc., Princeton 6, Ind.
Hanson Gates Mfg. Co., Inc., 8 Prescott St., Reading, Mass.
Harco Corp., 16901 Broadway, Bedford, O.
Hardinge Oil Burner & Mfg. Co., 1700 Berteau St., Chicago 13, Ill.
Harmond Company, 2114 Woodlawn, Cleveland 2, O.
Harnischfeger Corp., 4400 W. National Ave., Milwaukee 46, Wis.
Harold Electric Co., 210 E. Alder, Walla Walla, Wash.
Harper Co., H. M., Morton Grove, Ill.
Harrington & King Perforating Co., 5655 Fillmore St., Chicago 44, Ill.
Harris Calorific Co., The, 5501 Cass Ave., N. W., Cleveland 2, O.
Harris & Co., Arthur, 210 N. Aberdeen St., Chicago 7, Ill.
Harrisburg Steel Corp., 10th & Herr Sts., Harrisburg, Pa.
Harrison Radiator Div., General Motors, Lockport, N. Y.
Harrison Sheet Steel Co., 4718 W. 5th St., Chicago 44, Ill.
Harry Cooling Towers, Inc., 125 Cedar St., New York 6, N. Y.
Hart & Cooley Mfg. Co., Holland, Mich.
Hart Mfg. Co., The, 116 Bartholomew Ave., Hartford 1, Conn.
Hartmann Co., Chas., 985 Dean St., Brooklyn, N. Y.
Hartwell & Son, Inc., H. N., Park Square Bldg., Boston, Mass.
Hartzell Propeller Fan Co., P. O. Box 909, Roosevelt Ave., Piqua, O.
Harvey Aluminum, 19200 S. Western Ave., Torrance, Calif.
Harvey-Whipple, Inc., Springfield, Mass.
Harv-O-Metic Co., 3341 Cahuenga Blvd., Los Angeles 28, Calif.
Hasco Valve & Machine Co., 1263 N. 70th St., Milwaukee 13, Wis.
Haskel Engineering & Supply Co., 1236 S. Central Ave., Glendale, Calif.
Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.
Hastings Air Control, Inc., 3215 Leavenworth St., Omaha, Nebr.
Hastings Instrument Co., Inc., Main St., Warwick 33, Va.
Hauck Mfg. Co., 126-136 10th St., Brooklyn 15, N. Y.
Haveg Corp., Newark, Del.
Havens Structural Steel Co., Cooling Tower Div., 1713 Crystal Ave., Kansas City, Mo.
Haydon Co., A. W., 232 N. Elm, Waterbury, Conn.
Haydon Mfg. Co., Inc., Sub. General Time Instruments Corp., Torrington, Conn.
Hayes Furnace Mfg. & Supply Co., 3233 South LaCienega Blvd., Los Angeles 16, Calif.
Hays Corp., The, 800 E. 8th St., Michigan City 14, Ind.
Hays Mfg. Co., 801 W. 12th St., Erie, Pa.
Healey Co., Lee, 554 W. Garfield, Glendale 4, Calif.
Healy Ruff Co., 2257 University Ave., St. Paul 4, Minn.
Heat-Exchangers, Inc., 1812 W. Hubbard St., Chicago, Ill.
Heat & Power Corp., 424 E. Saratoga St., Baltimore 2, Md.
Heat-Timer Corp., 657 Broadway, New York 12, N. Y.
Heat Transmission Conduit Co., 2300 Payne Ave., Rm. 503, Cleveland 14, O.
Heatron, Inc., 333 Eberts Lane, York, Pa.
Heatube Corp., Allegan, Mich.
Heat-X, Inc., Brewster, N. Y.
Heating Assurance, Inc., 124 E. Augusta St., Spokane 13, Wash.
Heating Equipment Co., 19635 Schoolcraft, Detroit 23, Mich.
Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland, O.
Helical Tube Corp., 1825 Monroe Ave., N. W., Grand Rapids, Mich.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport 2, Conn.
Heller Laboratories, 124 Fort Lee Rd., Leonia, N. J.
Hendley & Whittemore, 6 Blackhawk Blvd., Beloit, Wis.
Hendrick Mfg. Co., 37 Dundaff St., Carbondale, Pa.
Henry Furnace Co., The, Medina, O.
Henry Valve Co., 3215 North Ave., Melrose Park, Ill.
Henszey Co., 202½ N. Water St., Watertown, Wis.
Herbusch Corp., The, 706 Chestnut St., 210 Title Guaranty Bldg., St. Louis 1, Mo.
Hercules Chemical Co., Inc., 332 Canal St., New York 13, N. Y.
Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7.
Heresite & Chemical Co., Manitowoc, Wis.
Hermon Hosmer Scott, Inc., 385 Putnam Ave., Cambridge 39, Mass.
Hersey Mfg. Co., Cor. E and 2nd Sts., South Boston 27, Mass.
Hershey Motorstokor, Inc., Manheim, Pa.
Hertner Electric Co., The, 12690 Elmwood Ave., Cleveland 11, O.
Hewitt-Robins Inc., 666 Glenbrook Rd., Stamford, Conn.
Hexdall Co., A. M., Morris, Ill.
Hi-Flow Products, Inc., 1395 Marconi Blvd., Copiague, N. Y.
Highside Chemicals Co., A Unit of Stewart Industries, Inc., 10 Colfax Ave., Clifton, N. J.
Hill Co., Francis, 5403 Prospect Ave., Cleveland, O.
Hill, E. Vernon & Co., P. O. Box 189, Lake Geneva, Wis.
Hill, Hubbell & Co., 3091 Mayfield Rd., Cleveland 18, O.
Hilliard Corp., 100 W. 4th St., Elmira, N. Y.
Hills-McCanna Co., 3023 N. Western Ave., Chicago 18, Ill.
Hilo Varnish Corp., Div. of Carpenter-Morton Co., 376 Third St., Everett 49, Mass.
Hinde & Dauch Paper Co., P. O. Box 861, Sandusky, O.
Hirschman-Pohle Co., Inc., 12 Lent Ave., LeRoy, N. Y.
Hite Mfg. Co., N. E., 303 North Elizabeth St., Chicago 7, Ill.
Hobart Bros., Co., Troy 1, O.
Hobsite Products Co., 308 Sussex St., Harrison, N. J.
Hodge Boiler Wks., 99-111 Sumner St., East Boston 28, Mass.
Hodgman Mfg. Co., Inc., 135 Washington St., Taunton, Mass.
Hoff Mfg. Co., Johnson Rd., Bethany, New Haven 15, Conn.
Hoffberger Co., C., Monument and Forrest, Baltimore 2, Md.
Hoffman Combustion Engrg. Co., 710 Marquette Bldg., Detroit, Mich.
Hoffman Specialty Mfg. Corp., 1700 W. 10th St., Indianapolis 7, Ind.
Hogart Engineering Co., 1050 S. Oliver St., Los Angeles, Calif.
Holby Tempering Valve Co., 1146 Second Ave., New York 21, N. Y.
Hollands Mfg. Co., Erie, Pa.
Holsclaw Bros., Inc., 408 N. Willow Rd., Evansville 11, Ind.
Holtzer-Cabot Electric Motor Div., National Pneumatic Co., Inc., 125 Armory St., Boston 19, Mass.
Homestead Valve Mfg. Co., P. O. Box 348, Coraopolis, Pa.
Hooker Electrochemical Co., 47th & Buffalo Sts., Niagara Falls, N. Y.
Hoover Co., The, Electric Motor Div., 68 Brook Ave., North Plainfield, N. J.
Hoppes Mfg. Co., Inc., 301 N. Greenmount Ave., Springfield, O.
Horn Co., Inc., A. C., 10th St. & 44th Ave., Long Island City, N. Y.
Horton Mfg. Co., 1179 15th Ave., Minneapolis 14, Minn.
Hossfeld Mfg. Co., 460 W. Third St., Winona, Minn.
Hotpoint Co., 5600 W. Taylor St., Chicago 44, Ill.
Hotstream Heater Co., 2363 E. 69th St., Cleveland 4, O.
Houghton & Co., E. F., 303 W. Lehigh Ave., Philadelphia 33, Pa.
Howard Industries, Inc., Racine, Wis.
Howe Ice Machine Co., 2825 Montrose Ave., Chicago 18, Ill.
Howell Electric Motors Co., Howell, Mich.
Howes-Woods Co., 201 Bridge St., Cambridge, Mass.
Hubbell Corp., P. O. Box 700, Hawley Rd., Mundelein, Ill.
Huck Mfg. Co., 2480 Bellvue, Detroit, Mich.
Hudson Industries, Inc., 4400 St. Aubin Ave., Detroit 7, Mich.
Humboldt Mfg. Co., 2016 N. Whipple St., Chicago, Ill.
Hungerford & Terry, Inc., Clayton, N. J.
Hunt & Son, C. B., Inc., Salem, O.
Hunt Spiller Mfg. Corp., 383 Dorchester Ave., Boston, Mass.

Hunter Fan and Ventilating Co., Inc., 400 S. Front St., Memphis, Tenn.
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa.
Hupp Corp., Globe Stamping Div., 1250 W. 76th St., Cleveland 2, O.
Huron Boiler Co., 10457 Gratiot Ave., Detroit 13, Mich.
Hussey & Co., C. G., Div. of Copper Range Co., 2850 Second Ave., Pittsburgh 19, Pa.
Huyette Co., Inc., Paul B., 401 N. Broad St., Philadelphia 8, Pa.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Hydreco Div., New York Air Brake Co., 1100 E. 222nd St., Cleveland 22, O.
Hydrotherm, Inc., Clinton Ave., Northvale, N. J.
Hy-Lo Burner Co., Inc., Eddington, Pa.
Hynes Electric Heating Div., Turbine Equipment Co., P. O. Box 578, Westfield, N. J.

I

Ideal Corp., Brooklyn 7, N. Y.
Ideal Electric & Mfg. Co., E. First & Oak Sts., Mansfield, O.
Ideal Industries, Inc., 1096 Parke Ave., Sycamore, Ill.
Ilg Electric Ventilating Co., 2841 N. Crawford Ave., Chicago 41, Ill.
Illinois Bronze Powder Co., 2015 S. Clark St., Chicago 16, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., 2035 S. Racine Ave., Chicago 8, Ill.
Illinois Malleable Iron Co., 1701 Wellington, Chicago 13, Ill.
Illinois Oil Products, Inc., 4th Ave. and 24th St., Rock Island, Ill.
Illinois Testing Laboratories, Inc., 420 N. La Salle St., Chicago 10.
Illinois Water Treatment Co., 840 Cedar St., Rockford, Ill.
Illinois Zinc Co., 2959 W. 47th St., Chicago 32, Ill.
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.
Imperial Damper Co., 664 Edgecombe Ave., New York 32, N. Y.
Imperial Electric Co., 64 Ira Ave., Akron, O.
Independent Blade Corp., P. O. Box 1482, Joliet, Ill.
Independent Register Co., 3747 E. 93rd St., Cleveland 5, O.
Industrial Acoustics Co., Inc., 341 Jackson Ave., New York 54, N. Y.
Industrial Engineering Corp., Terre Haute, Ind.
Industrial Engineering & Equipment Co., 711 S. Theresa Ave., St. Louis 3, Mo.
Industrial Filter & Pump Co., 5900 W. Ogden Ave., Chicago 50, Ill.
Industrial Metal Protectives, Inc., 401 Homestead Ave., Dayton 8, O.
Industrial Plastics Fittings Co., 3891 W. 150th St., Cleveland, O.
Industrial Products Co., 2820 N. Fourth St., Philadelphia 33, Pa.
Industrial Products Div., B. F. Goodrich Rubber Co., Marietta, O.
Industrial Screw Co., 4920 W. Madison, Chicago 44, Ill.
Industrial Service Laboratories, 710 W. National Ave., Milwaukee 4.
Industrial Sound Control, Inc., 45 Granby St., Hartford 12, Conn.
Infra Insulation, Inc., 525 Broadway, New York, N. Y.
Ingersoll Conditioned Air Div., Borg-Warner Corp., 760 E. Vine St., Kalamazoo, Mich.
Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.
Ingersoll Steel Div., Borg-Warner Corp., 310 S. Michigan Ave., Chicago 4, Ill.
Inland Heater Corp., 3402 University S.E., Minneapolis, Minn.
Inland Steel Co., 38 S. Dearborn St., Chicago 3, Ill.
Inland Steel Products Co., 4029 W. Burnham St., Milwaukee 1, Wis.
Inner-Tite Div. of Yara Engineering Corp., 18 W. Jersey St., Elizabeth 4, N. J.
Insto-Gas Corp., 1977 E. Woodbridge St., Detroit 7, Mich.
Instruments, Inc., P. O. Box 556, Tulsa, Okla.
Insulite Div. Minnesota and Ontario Paper Co., 500 Investors Bldg., Minneapolis 2, Minn.
Insul-Mastic Corp., 7750 W. 61st Place, Summit, Ill.
Inter-Coastal Paint Corp., 13th St. and Southern R. R., East St. Louis Ill.
Interchemical Corp., Finishes Div., 224 McWhorter St., Newark 1.
International Covers for Air Conditioners Corp., 532 Broadway, New York, N. Y.
International Boiler Works Co., The, 5 Birch St., East Stroudsburg, Pa.
International Business Machines Corp., 590 Madison Ave., New York 22, N. Y.
International Engineering, Inc., 1145 Bolander Ave., Dayton 1, O.
International Forge Co., 2308 S. Kedzie, Chicago, Ill.
International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.
International Heater Co., 101 Park Ave., Utica 2, N. Y.
International Mfg. Co., 600 E. Grand Ave., Oklahoma City, Okla.
International Metal Hose Co., Ashford Ave., Bellevue, O.
International Metal Products Co., P. O. Box 1712, Phoenix, Ariz.
International Nickel Co., Inc., The, 67 Wall St., New York 5, N. Y.
International Powder Metallurgy Inc., Ridgway, Pa.
International Register Co., 2620 W. Washington Blvd., Chicago 12, Ill.
International Sales Co., 2045 Evans Ave., San Francisco 24, Calif.
International Steel Co., 1545 Edgar St., Evansville, Ind.
International Vermiculite Co., Girard, Ill.
Interstate Heater Mfg. Co., 2627 West 6th Ave., Denver, Colo.
Iona Ventilator Co., Inc., 2821-29 W. Dauphin St., Philadelphia 32.
Ionaire, Inc., 390 First St., San Francisco 5, Calif.
Iron City Chemical & Construction Corp., Glycolator Sales & Service, P. O. Box 5814, Pittsburgh 9, Pa.
Iron Fireman Mfg. Co., 3170 W. 106 St., Cleveland 11, O.
Iron Lung Ventilator Co., 5403 Prospect Ave., Cleveland 3, O.
Irvington Varnish and Insulator, Div. of Minnesota Mining & Mfg. Co., 6 Argyle Terrace, Irvington 11, N. J.
Isoflex Corp., 947 Broadway, Redwood City, Calif.
Iwan Brothers, Inc., 1503 Prairie Ave., South Bend 14, Ind.

J

J O Mfg. Co., 8442 Otis St., South Gate, Calif.
Jabsco Pump Co., 2031 Lincoln St., Burbank, Calif.
Jack & Heintz, Inc., 17600 Broadway, Cleveland 1, O.
Jackes-Evans Mfg. Co., Controls Div., 4427 Geraldine Ave., St. Louis 15, Mo.
Jackson & Church Co., 321 N. Hamilton Ave., Saginaw 65, Mich.
Jaco Devices Co., 100 High St., Hingham, Mass.
Jacuzzi Bros., Inc., 5327 Jacuzzi Ave., Richmond, Calif.
James-Pond-Clark, 2181 E. Foothill Blvd., Pasadena 8, Calif.
Jamieson Mfg. Co., 819 Bedford, Dallas, Tex.
Jan-Air, Inc., Richmond, Ill.
Janette Elect. Mfg. Co., Lehigh at Main, Morton Grove, Ill.
Jefferson Electric Co., 25th & Madison St., Bellwood, Ill.
Jefferson Union Co., 607 W. 26th St., New York 1, N. Y.
Jeffrey Mfg. Co., 859 N. Fourth St., Columbus 16, O.
Jenkins Bros., 100 Park Ave., New York 17, N. Y.
Jenn-Air Products Co., 1102 Stadium Drive, Indianapolis 7, Ind.
Jennison Co., The, 87 Putnam St., Fitchburg, Mass.
Jerry Finn Engineers, 634 Grand Ave., St. Paul 5, Minn.
Jessop Steel Co., Washington, Pa.
Jet-Lube, Inc., 3093 N. California St., Burbank, Calif.
Jewel Mfg. Co., 1841 University Ave., St. Paul 4, Minn.
Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Johnson Bronze Co., 460 S. Mill St., New Castle, Pa.
Johnson Corp., The, 806 Wood St., Three Rivers, Mich.
Johnson Gas Appliance Co., 520 "E" Ave., N. W., Cedar Rapids, Ia.
Johnson Heater Corp., 1 Winnisimet St., Chelsea, Mass.
Johnson Machine Works, 619 Menomonie St., Eau Claire, Wis.
Johnson-March, 1724 Chestnut St., Philadelphia 3, Pa.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Johnson Metal Hose, Inc., 10 Sperry St., Waterbury 20, Conn.
Johnson Plastics Corp., Chagrin Falls, Ohio.
Johnson Service Co., 507 E. Michigan St., Milwaukee 1, Wis.
Johnson-Williams Inc., 2625 Park Blvd., Palo Alto, Calif.
Johnston Bros., Inc., Ferrysburg, Mich.
Johnston & Chapman Co., 2925 Carroll Ave., Chicago 12, Ill.
Johnston & Jennings Co., 6917 Bessemer Ave., Cleveland 27, O.
Johnston Foil Mfg. Co., 6100 S. Broadway, St. Louis 11, Mo.
Johnston Pump Co., P. O. Bin "K", Pasadena 15, Calif.
Jones Machinery Div., Hewitt-Robins, Inc., 4401 Roosevelt Rd., Chicago.
Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.
Jordan & Co., Inc., Paul R., 311 E. South St., Indianapolis 25, Ind.
Jordan Corp., 6013 Wiebe Ave., Cincinnati, O.
Josam Manufacturing Co., Corymbo Rd., Michigan City, Ind.
Joy Mfg. Co., Dept. 20, Henry W. Oliver Bldg., Pittsburgh 22, Pa.
Justrite Mfg. Co., 2061 N. Southport Ave., Chicago 14, Ill.
Justus Steam Trap Co., Napanoch, N. Y.

K

K-G Equipment Co., 1744 Lehigh St., Allentown, Pa.
KSM Products, Inc., Yale & Woodland Ave., Merchantville, N. J.
Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland 12, Calif.
Kaiser Co., E. B., 2114 W. Lake Ave., P. O. Box 276, Glenview, Ill.
Kaiser Co., H. S., 3336 Franklin Blvd., Chicago, Ill.
Kalamazoo Tank & Silo Co., Machine Tool Div., 500 Harrison St., Kalamazoo 16, Mich.
Kane Mfg. Corp., Kane, Pa.
Kates Co., W. A., The, 430 Waukegan Rd., Deerfield, Ill.
Kaufman Co., H. J., The, 13215 Roselawn Ave., Detroit 38, Mich.
Kaustine Furnace & Tank Corp., 1492 Washington Ave., Perry, N. Y.
Kawneer Co., Niles, Mich.
Kave & McDonald, Inc., 11-15 Central Ave., West Orange, N. J.
Kaykor Industries, Inc., Yardville, N. J.
Kaylo Div., Owens-Illinois Glass Co., Box 1035, Toledo 1, O.
Keasbey Co., Robert A., 139-149 W. 19th St., New York, N. Y.
Keasbey & Mattison Co., Butler Ave., Ambler, Pa.
Keckley Co., O. C., 3400 Cleveland St., Skokie, Ill.
Keco Industries, Inc., 2832 Spring Grove Ave., Cincinnati, O.
Keeler Co., E., 238 West St., Williamsport 3, Pa.
Keeney Mfg. Co., Main St., Newington 11, Conn.
Kehm Corp., The, 5000 S. Halsted St., Chicago, Ill.
Keleket X-Ray Corp., 212 W. 4th St., Covington, Ky.
Keller-Northrup, Inc., 2806 Canton St., Dallas, Tex.
Keller Tool Div. of Gardner-Denver Co., P. O. Box 268, Grand Haven, Mich.
Kellogg Co., M. W., The, 225 Broadway, New York 7, N. Y.
Kenco Pump Div., American Crucible Products Co., 1305 Oberlin Ave., Lorain, O.
Kenite Laboratory, Inc., 23 Samson Ave., P. O. Box 268, Madison, N. J.
Kennard Corp., 1819 S. Hanley Rd., St. Louis 17, Mo.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kenney Co., L. C., 2300 W. 59th St., Chicago 36, Ill.
Kensico Tube Co., Mt. Kisco, N. Y.
Kent-Moore Organization, Inc., General Motors Bldg., Detroit, Mich.
Ken-Way Corp., Sparta, Wis.
Kern Co., John A., 224 N. Loomis St., Chicago 7, Ill.
Kerotest Mfg. Co., 2525 Liberty Ave., Pittsburgh 22, Pa.
Kester Solder Co., 4201 Wrightwood Ave., Chicago 39, Ill.
Kewanee-Ross Corp., 101 Franklin St., Kewanee, Ill.
Kewaunee Mfg. Co., Adrian, Mich.
Key Co., 2617 McCasland, East St. Louis, Ill.
Keystone Asphalt Products Co., 101 E. Ontario St., Chicago 11, Ill.
Keystone Carbon Co., Inc., 1935 State St., St. Marys, Pa.
Keystone Tool Corp., P. O. Box 6716, Houston 5, Tex.
Kidder Mfg. Co., Inc., J. F., 426 Colchester Ave., Burlington, Vt.
Kieley & Mueller, Inc., 64 Genung St. Middletown, N. Y.
Kilbury Mfg. Co., Inc., 14529 Hawthorne Blvd., Lawndale, Calif.
Kilgore, Inc., Westerville, O.
Killebrew Engineering Corp., 8640 Pardee Lane, St. Louis 23, Mo.
King Co. of Owatonna, The, 928 N. Cedar St., Owatonna, Minn.

King Engineering Corp., 945Willard Ave., Ann Arbor, Mich.
King Refrigerator Co., 76-02 Woodhaven Blvd., Glendale, N. Y.
King Union Co., Inc., Hillsgrove, R. I.
King Zeero Co., The, 4300 — 14 W. Montrose Ave., Chicago 41, Ill.
Kingsford Foundry & Machine Wks., 264 W. Second St., Oswego, N. Y.
Kingsley Mfg. Co., 420 Howard Ave., New Haven, Conn.
Kinney Mfg. Div., The New York Air Brake Co., 3529 Washington St., Boston 30, Mass.
Kirk & Blum Mfg. Co., 3120 Forrer St., Cincinnati 9, O.
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kisco Boiler & Engineering Co., 2414 Dekalb St., St. Louis 4, Mo.
Klauer Mfg. Co., 9th and Washington Sts., Dubuque, Ia.
Kleer Kleen Mfg. Co., 140 Orchard Ave., Hayward, Calif.
Klenk's Aviation Snips, 107 E. 5th St., Wilmington, Del.
Kling Bros., Engineering Works, 1320 N. Kostner Ave., Chicago 51, Ill.
Klipfel Valves, Inc., 1075 Lincoln Ave., Hamilton, O.
Knapp Bros. Mfg. Co., Inc., 16 East 72nd St., Cincinnati 16, O.
Knapp Mills, Inc., 23-15 Borden Ave., Long Island City 1, N. Y.
Knight, Maurice A., Kelly Ave., Akron 9, O.
Knights Co., James, Sandwich, Ill.
Knoblock Co., 2301 Alex, Newport, Ky.
Knowles Mushroom Ventilator Co., 160 Bellevue Ave., Upper Montclair, N. J.
Kobe Inc., 3040 E. Slauson, Huntington Park, Calif.
Koch Refrigerators, Inc., 401 Funston Rd., Kansas City 15, Kans.
Kody Blower Co., 1150 Southard St., Trenton 5, N. J.
Kol-Master Corp., 161 Walberg St., Oregon, Ill.
Kool Kar Co., Inc., 1468 Penobscot Bldg., Detroit, Mich.
Kopperman & Sons, Joseph, 316 New St., Philadelphia 6, Pa.
Koppers Co., Inc., Koppers Bldg., Pittsburgh 19, Pa.
Koppers Company, Inc., Metal Products Div., 200 Scott St., Baltimore 3, Md.
Korfund Co., Inc., 48-01-F 32nd Pl., Long Island City 1, N. Y.
Koven & Bro., L. O., Inc, 154 Ogden Ave., Jersey City 7, N. J.
Kraissl Co., Inc., The, Terhune and Williams Aves., Hackensack, N. J.
Kraloy Plastic Pipe Co., Inc., 4720 E. Washington Blvd., Los Angeles, Calif.
Kramer Trenton Co., N. Olden & Breunig Aves., Trenton 5, N. J.
Krehbiel Co., J. H., 425 N. Crawford Ave., Chicago, Ill.
Kresky Mfg. Co., Second & H Streets, Petaluma, Calif.
Kritzer Radiant Coils, Inc., 2901 W. Lawrence Ave., Chicago 25, Ill.
Krueger Air Conditioning Co., 19 E. Rillito St., Tucson, Ariz.
Krueger Sentry Gauge Co., 1056 W. Mason St., Green Bay, Wis.
Kuhns Bros. Co., 1800 McCall St., Dayton 8, O.
Kulka Electric Mfg. Co., Inc., 633 S. Fulton Ave., Mt. Vernon, N. Y.
Kunkle Valve Co., 121 S. Clinton St., Ft. Wayne 2, Ind.
Kwikon Co., 1850 W. Washington, Chicago 12, Ill.

L

L. O. F. Glass Fibers Co., 1810 Madison Ave., Toledo 1, O.
LaBour Co., Inc., The, 1301 Sterling Ave., Elkhart, Ind.
Laclede Steel Co., Arcade Bldg., Rm. 1317, St. Louis 1, Mo.
Laclede Stoker Co., 4438 Hunt Ave., St. Louis 10, Mo.
La Crosse Steel Roofing & Corrugating Co., 227 Jay St., La Crosse, Wis.
Ladish Co., 5300 S. Packard Ave., Cudahy, Wis. (Milwaukee Suburb)
Ladish Co., Tri-Clover Div., 2809 60th St., Kenosha, Wis.
LaFavorite Rubber Mfg. Co., 256 Wagaraw Rd., Hawthorne, N. J.
Labarco Industries, 721 2nd Ave., N., Minneapolis 5, Minn.
Lake Chemical Co., 3052 W. Carroll Ave., Chicago 12, Ill.
Lakewood Engineering & Mfg. Co., 212 N. Carpenter St., Chicago 7, Ill.
Lamb Electric Co., Kent, O.
Lammert & Mann Co., Wood & Walnut Sts., Chicago 12, Ill.
Lamneck Div., Clayton & Lambert Mfg. Co., 1026 Lamneck St., Middletown, O.
Lamson & Sessions Co., The, 1971 W. 85th St., Cleveland 2, O.
Lancaster Heat Transfer Co., Inc., 123 DeKalb Ave., Brooklyn, N. Y.
Lancaster Pump & Mfg. Co., Manheim Rd., Lancaster, Pa.
Landis Machine Company, Fifth and Church Sts., Waynesboro, Pa.
Larkin Coils, Inc., 519 Memorial Dr., S. E., Atlanta 1, Ga.
Larkin Packer Co., Inc., 6200 Maple Ave., St. Louis 14, Mo.
Lastik Products Co., Inc., 201 Iroquois Bldg., Pittsburgh 13, Pa.
Lattner Mfg. Co., P. M., 1411-9th St., S. W., Cedar Rapids, Iowa
Lau Blower Co., 2001 Home Ave., Dayton 7, O.
Lawler Automatic Controls, Inc., 453 N. MacQuesten Pkwy., Mount Vernon, N. Y.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
Lawrence Pumps Inc., 371 Market St., Lawrence, Mass.
Layne & Bowler, Inc., Box No. 6697, Hollywood Sta., Memphis 8, Tenn.
Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif.
Lead Lined Iron Pipe Co., 1 Broadway, Wakefield, Mass.
Leahy Mfg. Co., 1804 E. 8th St., Los Angeles, Calif.
Leavitt Machine Co., East River St., Orange, Mass.
Lecourtenay Co., 5 Maine St., Newark 5, N. J.
Ledeen Mfg. Co., 1600 S. San Pedro St., Los Angeles 15, Calif.
Lee Co., K. O., Aberdeen, S. D.
Lee Corp., P. O. Box 1801, Wilmington, Del.
Lee-Don, Inc., Grant Bldg., Pittsburgh, Pa.
Lee & Son, Thomas, 128-132 W. Second St., Cincinnati 2, O.
Lee Vine Fin-Tube Radiator Co., Inc., 10 Fair St., New Haven, Conn.
Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Lees Div., John, The, Serrick Corp., Batavia St., and Kilgore Ave., Muncie, Ind.
Lefax Publishers, 9th & Sansom, Philadelphia 7, Pa.
Leffel & Co., James, The, 426 East St., Springfield, O.
Lehigh Fan & Blower Co., 17th and Sumner Ave., Allentown, Pa.
Lehigh Mfg. Co., Div. of Lehigh Inc., Lancaster, Pa.
Leibfried Mfg. Corp., C. H., 95 Guernsey, Brooklyn, N. Y.
Leiman Bros., Inc., 163 W. Christie St., Newark, N. J.
Leland Electric Co., The, Div. of American Machine & Foundry Co., 1501 Webster St., Dayton 1, O.
Lemlar Mfg. Co., 715 W. Redondo Beach Blvd., Gardena, Calif.
Lenk Mfg. Co., 30 Cummington St., Boston 15, Mass.
Lennox Industries, Inc., The, Marshalltown, Ia.
Lennox Industries, Inc., 1711 Olentangy River Rd., Columbus, O.
Leslie Co., 237 Grant Ave., Lyndhurst, N. J.
Leslie Welding Co., Inc., 2943 Carroll Ave., Chicago 12, Ill.
Levow, David, 308 W. 20th St., New York 11, N. Y.
Lewellen Mfg. Co., Columbus, Ind.
Lewin-Mathes Co., Lewin Metals Div., 1111 Chouteau Ave., St. Louis 2, Mo.
Lewis & Co., Joseph E., 1319 Carroll St., Baltimore, Md.
Lewis Mfg. Co., Inc., 3044 S. W. 28th Lane, Miami 33, Fla.
Lewyt Air-Conditioner Corp., 5702 First Ave., Brooklyn, N. Y.
Lexsuco, Inc., 4815 Lexington Ave., Cleveland 3, O.
Leyman Mfg. Corp., John H. McGowan Co. Div., 1416 First National Bank Bldg., Cincinnati 2, O.
Libbey-Owens-Ford Glass Co., 608 Madison Ave., Toledo 3, O.
Libert Machine Co., 324 N. Roosevelt St., Green Bay, Wis.
Lientz Co., B. P., P. O. Box 2275, Kansas City, Mo.
Lilie-Hoffmann Cooling Towers, Inc., 1450 So. Vandeventer Ave., St Louis 10, Mo.
Lima Electric Motor Co., The, Lima, O.
Lima Register Co., The, 651 N. Baxter St., Lima, O.
Limitorque Corp., Erie Ave. & G St., Philadelphia 34, Pa.
Lincoln Electric Co., The, 22801 St. Clair Ave., Cleveland 17, O.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Lindquist Pump Corp., 10001 W. Jefferson Blvd., Culver City 12, Calif.
Lindy Heaters, Inc., 2370 Hoffman St., New York 58, N. Y.
Line Material Co., Div. of McGraw Electric Co., 700 W. Michigan, Milwaukee, Wis.
Linear Incorporated, N. W. Cor. State Rd. & Levick St., Philadelphia 35, Pa.
Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.
Lintern Corp., Route 20 East, Painesville, O.
Lipman Refrigeration Div., Yates-American Co., Beloit, Wis.
Liquid Carbonic Corp., 3100 S. Kedzie Ave., Chicago 23, Ill.
Liquidepth Indicators, Inc., 43-22 Tenth St., Long Island City 1, N. Y.
Liquidometer Corp., 37-15 Skillman Ave., Long Island City 1, N. Y.
Lithcote Corp., 5000 W. Lake St., Melrose Park, Ill
Little Giant Vaporizer Co., Inc., 5105 Classen Blvd., P. O. Box 3535, Oklahoma City 6, Okla.
Little Mfg. Co., M. S., 151 New Park Ave., Hartford 6, Conn.
Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, O.
Locke Regulator Co., Walter and Osborne Sts., Salem, Mass.
Lockformer Co., The, 4615 W. Roosevelt Rd., Chicago 50, Ill.
Lockport Mills, Inc., Lockport, N. Y.
London Chemical Co., 1535 N. 31st Ave., Melrose Park, Ill.
Longergan Co., J. E., 2nd and Race Sts., Philadelphia 6, Pa.
Lookout Boiler & Mfg. Co., Compress St. & Mfrs. Rd., Chattanooga 1, Tenn.
Lord Mfg. Co., 1635 W. 12th St., Erie, Pa.
Lord & Clark Co., Inc., 791 Tremont St., Boston 18, Mass.
Loren Cook Co., Berea, Ohio.
Louisville Drying Machinery Unit, General American Transportation Corp., 139 So. 4th St., Louisville 2, Ky.
Louvra Mfg. & Sales Co., 1010 Jeanette Ave., Union, N. J.
Lovejoy Flexible Coupling Co., 4987 W. Lake St., Chicago 44, Ill.
Lowell Wrench Co., 54 Commercial St., Worcester 8, Mass.
Lucey Boiler & Mfg. Corp., 1514 Chestnut St., Chattanooga, Tenn.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Foot of Adams St., Troy, N. Y.
Lufkin Rule Co., Saginaw, Mich.
Lug-All Co., The, Wynnewood 29, Pa.
Lukens Steel Co. and Divisions, 308 S. First Ave., Coatesville, Pa.
Lumm Co., A. H., 3151 South Ave., Toledo 9, O.
Lumsden & Van Stone, Div. of Midwest Piping Co., Inc., 426 First St., South Boston 27, Mass.
Lunkenheimer Co., Waverly & Beckman Sts., Cincinnati 14, O.
Lurie & Lurie, 560 W. Washington, Chicago 6, Ill.
Luzerne Rubber Co., Muirhead Ave., Trenton 7, N. J.
Lynch Asbestos Co., 2939 So. Sunol Drive, Los Angeles 23, Calif.
Lynch Corp., Crystal & Ames St., Anderson, Ind.
Lynchburg Foundry Co., Courtland Bldg., Lynchburg, Va.

M

M B Mfg. Co., 1060 State St., New Haven 11, Conn.
M & E Mfg. Co., 2757 Winthrop Ave., Indianapolis, Ind.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
M-M-A, Inc., Coho Bldg., Lancaster, Pa.
M M M, Inc., 7126 Avenue C, Houston, Tex.
Maas & Waldstein Co., 2121 McCarter Highway, Newark 4, N. J.
Macksons Co., 125 Cedar St., New York 6, N. Y.
Mac-Lean-Fogg Lock Nut Co., 5535 N. Wolcott Ave., Chicago 40, Ill.
Madden Brass Products Co., P. O. Box 444, Aurora, Ill.
Madden Corp., The, 1543 Morse Ave., Chicago, Ill.
MaGirl Foundry & Furnace Co., 413 E. Oakland Ave., Bloomington, Ill.
Magnetic Seal Corp., 301 Sowams Rd., Barrington, R. I.
Magnetrol, Inc., 2110 S. Marshall Blvd., Chicago 23, Ill.
Magnode Products, Inc., Box 292, Trenton, O.
Magnus Chemical Co., South Ave., Garwood, N. J.
Mahon Co., R. C., The, P. O. Box 4666, Detroit 34, Mich.

Mahr Mfg. Co., 6322 Cambridge, Minneapolis, Minn.
Maid-O'-Mist, Inc., 3217 N. Pulaski Rd., Chicago 41, Ill.
Maintenance Engineering Corp., 3611 Clinton Dr., Houston, Tex.
Mall Tool Co., 7740 South Chicago Ave., Chicago 19, Ill.
Malleable Iron Fittings Co., Branford, Conn.
Mallory Co., P. R., The, 3029 E. Washington, Indianapolis 6, Ind.
Mallory Sales Co., 13904 Lincoln Ave., Dolton, Ill.
Maloney Co., F. H., P. O. Box 1777, Houston, Tex.
Mammoth Furnace Co., 509 Vandalia St., St. Paul 4, Minn.
Manhattan Perforated Metal Co., Inc., 43-17 37th St., Long Island City 1, N. Y.
Manheim Mfg. & Belting Co., 325 Stiegel St., Manheim, Pa.
Manitowoc Shipbuilding, Inc., 16th & The River, Manitowoc, Wis.
Manning Co., Charles E., 90 Clairton Blvd., Pittsburgh 36, Pa.
Manning & Lewis Engineering Co., 32 Ogden St., Newark 4, N. Y.
Manning, Maxwell & Moore, Inc., 250 East Main St., Stratford, Conn.
Mansfield & Green, 1051 Power Ave., Cleveland 14, O.
Manufacturers Corp., 104 Ausdale Ave., P. O. Box 434, Mansfield, O.
Maplewood Machinery Co., Inc., 2634 Fullerton Ave., Chicago 47, Ill.
Marathon Electric Mfg. Corp., Cherry and Randolph Sts., P. O. Box 630, Wausau, Wis.
Marble-Card Electric Co., Gladstone, Mich.
Marco Co., Inc., 1000 Hess St., Saginaw, Mich.
Marco Industries, Inc., 3d & Franklin Sts., Womelsdorf, Pa.
Marion Machine Foundry & Supply Co., Marion, Ind.
Marley Co., The, 222 West Gregory Blvd., Kansas City 14, Mo.
Marlin-Rockwell Corp., Jamestown, N. Y.
Marlo Coil Co., 6135 Manchester Rd., St. Louis 10, Mo.
Marlow Pumps, Division of Bell & Gossett Co., Ridgewood, N. J.
Marman Products Co., Inc., A Subsidiary of Aeroquip Corp., 11214 Exposition Blvd., Los Angeles 64.
Marquart Mfg. Co., 1241 High St., Oakland 1, Calif.
Marquette Coppersmithing Co., Christian & Water Sts., Philadelphia 47, Pa.
Marquette Mfg. Co., Inc., 307 E. Hennepin Ave., Minneapolis 14, Minn.
Marsh Heating Equipment Co., 3501 Howard St., Skokie, Ill.
Marsh Instrument Co., 3501 Howard St., Skokie, Ill.
Marsh Valve Co., 4th St., & Brigham Rd., Dunkirk, N. Y.
Marshalltown Mfg. Co., 901 E. Nevada, Marshalltown, Ia.
Marsto Machine Co., 231 Willard St., West Quincy 69, Mass.
Martin Co., Inc., J. O., 637 Minna St., San Francisco 3, Calif.
Martin Fan & Blower Co., 4634 W. 21st Pl., Chicago 50, Ill.
Martin Metal Products Corp., 8550 North End, Ferndale, Mich.
Martin & Sons, H. P., 801 W. 12th St., Owensboro, Ky.
Marvel Engineering Co., 7227 N. Hamlin Ave., Chicago 45, Ill.
Marviray, Inc., 54 Clifton St., Newark 5, N. J.
Mason-Neilan Regulator Co., Norwood, Mass.
Master Control Co., The, 2034 Fifth St., Cuyahoga Falls, O.
Master Electric Co., 126 Davis Ave., Dayton 1, O.
Master Enterprise Corp. of America, Boulder Bldg., Tulsa, Okla.
Master Mechanics Co., 2097 Columbus, Cleveland, O.
Master Vibrator Co., 361 Stanley Ave., Dayton, Ohio.
Mathis Co., The, 1227 Broadway, Ft. Worth, Tex.
Matrix Engineering Corp., 3016 E. Lake St., Minneapolis 6, Minn.
Matthiessen & Hegeler Zinc Co., 9th & Sterling Sts., La Salle, Ill.
Maurath, Inc., 21800 Miles Ave., Cleveland 22, O.
Maurey Mfg. Corp., 2911 S. Wabash Ave., Chicago 16, Ill.
Maxitrol Co., 12200 Beech Rd., Detroit 39, Mich.
Maxon Premix Burner Co., Muncie, Ind.
May Company, Galesburg, Ill.
Mayer Refrigerating Engineers, Inc., Lincoln Park, N. J.
Mayne Products Co., 324 Harries Bldg., Dayton 2, O.
Mayson Mfg. Co., 4332 Horatio St., Detroit 10, Mich.
McAlear Mfg. Co., 1921 S. Western Ave., Chicago 8, Ill.
McAuley Trap Co., 104 First Ave., Pittsburgh 22, Pa.
McCord Corp., 2587 E. Grand Blvd., Detroit 11, Mich.
McCorkle Co., D. H., 6th & Bancroft Way, Berkeley 2, Calif.
McDonald Mfg. Co., A. Y., 12th & Pine Sts., Dubuque, Iowa.
McDonnell & Miller, Inc., 3500 N. Spaulding Ave., Chicago 18, Ill.
McGraw Electric Co., Clark Div., 5201 W. 65th St., Chicago 28, Ill.
McGraw Electric Co., Lonergan Mfg. Div., Edison & Clark St., Albion, Mich.
McIntire Co., The, Okner Parkway, P. O. Box 5, Livingston, N. J.
McIntyre Engineering Co., Inc., 137 S. Linden Ave., South San Francisco, Calif.
McKay Co., 1005 Liberty Ave., Pittsburgh 22, Pa.
McLarty Systems, 2600 Dickman Rd., Battle Creek, Mich.
McMillan Industrial Supplies, C. C., 3912 S. W. Dolph Court, Portland 19, Oregon.
McNeill Smoke Eliminator Co., 523 N. Halsted, Chicago, Ill.
McPherson Furnace & Supply Co., 1805 N. E. Second Ave., Portland 12, Ore.
McQuay, Inc., 1600 Broadway, N. E., Minneapolis 13, Minn.
McQuay-Norris Mfg. Co., Southwest Ave. at Marconi, St. Louis 10
McRae Corp., 750 N. Glendale Ave., Glendale 6, Calif.
McWane Cast Iron Pipe Co., 1201 Vanderbilt Rd., Birmingham 2, Ala.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., P. O. Box 223, Bridgeport, Pa.
Mechanical Industries Production Co., 217-223 Ash St., Akron 8, O.
Mechanical Products Corp., 168 N. Ogden Ave., Chicago 7, Ill.
Meier Electric & Machine Co., Inc., 3525 E. Washington St., Indianapolis 7, Ind.
Mel Products Co., The, 554 Chapel St., New Haven, Conn.
Melchoir, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.
Meldon Industries Div., Tool Industries, Inc., 15438 Telegraph Rd., Detroit, Mich.
Memphis Pump & Mfg. Co., P. O. Box 3215, Memphis, Tenn.
Menardi & Co., 1222 E. Grand Ave., El Segundo, Calif.
Merchant & Evans Co., 2035 Washington Ave., Philadelphia 46, Pa.
Mercoid Corp., The, 4201 Belmont Ave., Chicago 41, Ill.
Mercury Clutch Div., Automatic Steel Products, Inc., Canton 6, O.
Meriam Instrument Co., The, 10929 Madison Ave., Cleveland 2, O.
Mesker Steel Corp., Geo. L., 400 N. W. First St., Evansville 8, Ind.
Mesta Machine Co., West Homestead, Pittsburgh, Pa.
Metalcraft Inc., Mason City, Ia.
Metal Fabricators, Inc., P. O. Box 3232, Charlotte 3, N. C.
Metal Products Eng., Inc., 4000 Long Beach Ave., Los Angeles 58, Calif.
Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y.
Metallo Gasket Co., 16 Bethany St., New Brunswick, N. J.
Metalweld, Inc., Protective Coatings Div., Scotts Lane & Abbotsford Ave., Philadelphia 29, Pa.
Metropolitan Refining Co., Inc., 50-23 Twenty-Third St., Long Island City 1, N. Y.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., 4366 Worth St., Los Angeles 63, Calif.
Meyer & Bro. Co., F., 308 S. Commercial St., Peoria 2, Ill.
Meyer Furnace Co., The, P. O. Box 989, Peoria 1, Ill.
Meyer & Wenthe, Inc., 30 S. Jefferson St., Chicago, Ill.
Michigan Pipe Co., Gagetown, Mich.
Michigan Plastic Pipe Co., 20050 Livernois St., Detroit, Mich.
Michigan Tool Co., 7171 E. McNichols Rd., Detroit, Mich.
Micro Metallic Corp., 30 Sea Cliff Ave., Glen Cove, N. Y.
Micro Products Co., 20 N. Wacker Dr., Chicago 6, Ill.
Micro Switch Div. of Minneapolis-Honeywell Regulator Co., Chicago & Spring Sts., Freeport, Ill.
Microtron Corp., P. O. Box 2092, Charlotte, N. C.
Midco Register Corp., 1059 Grand Ave., St. Paul, Minn.
Mid-Continent Metal Products Co., 1960 Clybourn Ave., Chicago 14.
Midland Paint & Varnish Co., 3802 E. 91st St., Cleveland 5, O.
Mid-States Welder Mfg. Co., 6025 S. Ashland Ave., Chicago 36, Ill.
Midwest Air Conditioning Co., 510 Third St., Des Moines, Ia.
Midwest Automatic Control Co., 510 Third St., Des Moines, Ia.
Midwest Piping Co., Inc., 1450 S. Second St., St. Louis 4, Mo.
Miller Electric Mfg. Co., Inc., 718 S. Bounds St., Appleton, Wis.
Miller-Harris Instrument Co., 601 E. Ogden Ave., Milwaukee 2, Wis.
Miller Valve Co., Inc., P. O. Box 1255, Pittsburgh 30, Pa.
Millers Falls Co., 57 Wells St., Greenfield, Mass.
Mill-Rose Co., 1985 E. 59th St., Cleveland, O.
Milton Equipment Co., N. E. Cor. 4th Race St., Philadelphia 6, Pa.
Milton Roy Co., 1371 E. Mermaid Ave., Philadelphia 18, Pa.
Milwaukee Electric Tool Corp., 5316 W. State St., Milwaukee 8, Wis.
Milwaukee Gas Specialty Co., P. O. Box 461, Milwaukee, Wis.
Milwaukee Valve Co., S. Burrell St. at E. Hayes Ave., Milwaukee 7.
Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.
Minerallac Electric Co., 25 N. Peoria St., Chicago 7, Ill.
Minneapolis-Honeywell Regulator Co., 2641 4th Ave., S., Minneapolis 8, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.
Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., 411 Piquette, Detroit, Mich.
Minnesota & Ontario Paper Co., Investors Bldg., Minneapolis, Minn.
Minnesota Rubber & Gasket Co., 3630 Wooddale Ave., Minneapolis.
Minn-Kota Foundry & Mfg. Co., P. O. Box 822, Fargo, N. D.
Miracle Adhesives Corp., 214 E. 53rd St., New York 22, N. Y.
Mir-O-Col Alloy Co., Inc., 308 North Ave., 21, Los Angeles 31, Calif.
Mirror Patented Stove Pipe Co., 55-65 Park St., Hartford 14, Conn.
Misener Mfg. Co., Inc., 200-8 Walton St., Syracuse 2, N. Y.
Mission Appliance Corp., 12611 Crenshaw Blvd., Hawthorne, Calif.
Mississippi Glass Co., St. Louis 7, Mo.
Mitchell Co., John E., 3800 Commerce St., Dallas, Tex.
Mitchell & Co., Inc., W. K., 29th & Ellsworth, Philadelphia 46, Pa.
Mitchell Mfg. Co., 2525 N. Clybourn Ave., Chicago, Ill.
Modern Engineering Co., 3411 Pine Blvd., St. Louis 3, Mo.
Modern Hanger Co., 4734 Hough, Cleveland, Ohio
Modernheat Cable Corp., Box 576, Kingsport, Tenn.
Modern-Woodmanse Sales Div., George Goetz Corp., West Chicago, Ill
Modine Mfg. Co., 1509 De Koven Ave., Racine, Wis.
Moeller Instrument Co., 132nd St. & 89th Ave., Richmond Hill 18, N. Y.
Moeschl-Edwards Corrugating Co., Inc., The, P. O. Box 1115, Cincinnati 1, O.
Molco Drilling Machines, ~~Inc., 1100~~ 20th St., N. W., Washington 6, D. C.
Monarch Mfg. Works, Inc., 2501 E. Ontario St., Philadelphia 34, Pa.
Monash-Younker Co., Inc., 1315 W. Congress St., Chicago 7, Ill.
Monitor Controller, 99 Grove St., Rockland, Mass.
Monogram Products Co., Inc., 731 N. 35th St., Philadelphia 4, Pa.
Monsanto Chemical Co., 800 N. 12th Blvd., St. Louis 1, Mo.
Monsanto Chemical Co., Merrimac Div., Everett Sta., Boston 49, Mass.
Montag Inc., 2011 N. Columbia Blvd., Portland 17, Ore.
Montgomery Bros., 1122 Howard St., San Francisco, Calif.
Montgomery Chemical Co., Jenkintown, Pa.
Moore Inc., Goodloe E., 2811 N. Vermilion, Danville, Ill.
Moore Co., The, 800 S. Missouri, Marceline, Mo.
Moore & Co., Samuel, Mantua, O.
Moore Dry Kiln Co., 1220 W. State St., Jacksonville, Fla.
Moore Products Co., H and Lycoming Sts., Philadelphia 24, Pa.
Moraine Products Div., General Motors Corp., Dayton 1, O.
Moran Flexible Joint Co., Inc., 3745 Crittenden Dr., Louisville, Ky.
Morehead Mfg. Co., 2455 W. Warren Ave., Detroit 8, Mich.
Moreheat Distribution Inc., 5608 Stewart Rd., Cincinnati 27, O.
Morganite, Inc., Carbon Specialties Div., 3304 48th Ave., Long Island City 1, N. Y.
Morrill Motors, 3100 Fairchild Ave., Ft. Wayne, Ind.
Morris Coupling & Clamp Co., P. O. Box 10, Kittanning, Pa.
Morris Sheet Metal Works, 635 W. Mound St., Columbus 23, O.
Morrison Brothers Co., 24th & Elm Sts., Dubuque, Ia.
Morrison Products, Inc., E. 168th St. and Waterloo Rd., Cleveland 10, O.
Morse-Boulger Destructor Co., 80 5th Ave., New York 17, N. Y.
Morse Chain Co., Ithaca, N. Y.

Morse-Smith-Morse Co., The, 165 Dexter Ave., Watertown 72, Mass.
Mortell Co., J. W., Kankakee, Ill.
Morton Engineering Service, Paul S., 609 Bangor Rd., Lawrence, Mich.
Mt. Hawley Mfg. Co., Inc., Mt. Hawley Air Port, Peoria 4, Ill.
Mountain States Equipment Co., 1238 Speer Blvd., Denver 4, Colo.
Muckle Mfg. Co., Owatonna 3, Minn.
Mueller Brass Co., 1925 Lapeer Ave., Port Huron 1, Mich.
Mueller Climatrol, 2005 W. Oklahoma Ave., Milwaukee 15, Wis.
Mueller Co., 512 W. Cerro Gordo St., Decatur, Ill.
Mueller Steam Specialty Co., Inc., 40-20 22nd St., Long Island City 1, N. Y.
Mult-A-Frame Div., Ainsworth Mfg. Corp., 1471 E. Atwater St., Detroit 7, Mich.
Multi-Cell Sales Corp., 3420 Nicollet Ave., Minneapolis 8, Minn.
Multiplex Mfg. Co., Berwick, Pa.
Multi-Vent Div., Pyle-National Co., The, 1373 Kostner Ave., Chicago 51, Ill.
Muncie Gear Wks., Inc., 700 N. Wysor, Muncie, Ind.
Mund Boilers, Inc., 1600 N. Indiana St., Los Angeles 63, Calif.
Mundet Cork Corp., 7101 Tonnelle Ave., North Bergen, N. J.
Mundt & Sons, Charles, 53 Fairmount Ave., Jersey City 4, N. J.
Munn & Steele, Inc., Castle Island Terminal, South Boston, Mass.
Munray Products, Inc., 12400 Crossburn St., Cleveland, O.
Murray Co. of Texas, The, P. O. Box 1517, Atlanta, Ga.
Murray Iron Wks. Co., 1106 Washington St., Burlington, Ia.
Murray Mfg. Co., D. J., 1002-24 Third St., Wausau, Wis.
Mutual Liquid Gas & Equipment Co., 17129 S. Broadway, Gardena, Calif.
Myers & Bro. Co., F. E., The, Ashland, O.
Myers Electric Co., Inc., 209 First Ave., Pittsburgh 22, Pa.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., 2635 N. Kildare Ave., Chicago 39, Ill.

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Nash Engineering Co., 307 Wilson Ave., South Norwalk, Conn.
Nason Co., Clarkston, Mich.
Nat Corp., 2710 McGee St., Kansas City 8, Mo.
National Acme Co., The, 170 E. 131st St., Cleveland 8, O.
National Airoil Burner Co., Inc., 1330 E. Sedgley Ave., Philadelphia 34, Pa.
National Aluminate Corp., 6215 W. 66th Pl., Chicago 38, Ill.
National Aniline Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
National Carbon Co., A Div. of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
National Coal Association, Southern Bldg., Washington 5, D. C.
National Cork Co., 1 Engle Street, Englewood, N. J.
National Cylinder Gas Co., 840 N. Michigan Ave., Chicago 11, Ill.
National Dust Collector Corp., 549 W. Washington, Chicago 6, Ill.
National Engineering & Mfg. Co., 16th & Lamine St., Sedalia, Mo.
National Engineering Products, Inc., Commerce and Savings Bldg., Washington, D. C.
National Gas Equipment Co., Inc., P. O. Box 122, Denison, Tex.
National Gypsum Co., 325 Delaware Ave., Buffalo, N. Y.
National Heater Co., 2180 Cleora Ave., St. Paul 4, Minn.
National Instrument Laboratories, Inc., 6108 Rhode Island Ave., Riverdale, Md.
National Lead Co., 111 Broadway, New York 6, N. Y.
National Lock Co., Inc., 1902 Seventh St., Rockford, Ill.
National Oil Burner Co. of N. Y., Inc., 614 Bergen St., Brooklyn, N. Y.
National Pipe Bending Co., 122 River St., New Haven 13, Conn.
National Pipe Coatings, Inc., 3480 East Randolph St., Huntington Park, Calif.
National-U. S. Radiator Corp., The, 221 Central Ave., Johnstown, Pa.
National Steam Pump Co., 701 W. Johnson St., Upper Sandusky, O.
National Steel Construction Co., 301 Water St., Logansport, Ind.
National Super Servce Co., Inc., 1944 N. 13th St., Toledo 2, O.
National Time & Signal Corp., 21800 Wyoming Ave., Detroit 20, Mich.
National Tube Div., United States Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.
National Valve & Mfg. Co., 3101 Liberty Ave., Pittsburgh 1, Pa.
Naugatuck Chemical Div., United States Rubber Co., Naugatuck, Conn.
Naylor Pipe Co., 1230 E. 92nd St., Chicago 19, Ill.
Nebel Mfg. Co., P. O. Box 3942, Shaker Square Sta., Cleveland 20, O.
Nebraska Boiler Company, Inc., 235 N. 9th St., Lincoln, Nebr.
Neff-Perkins Mfg. Co., 2130 St. Clair, Cleveland, O.
Nelson Mfg. Co., B. F., 401 Main St., N. E., Minneapolis 13, Minn.
Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.
Neptune Meter Co., 19 W. 50th St., New York 20, N. Y.
Nesbitt, Inc., John J., State Rd. & Rhawn St., Philadelphia 36, Pa.
New Departure Div., General Motors Corp., Bristol, Conn.
New England Carbide Tool Co., Inc., Brookline St., Cambridge, Mass.
New Haven Copper Co., The, Seymour, Conn.
New Jersey Zinc Sales Co., 160 Front St., New York 38, N. Y.
New York Air Valve Corp., 1850 Atlantic Ave., Brooklyn 33, N. Y.
New York Belting & Packing Co., 1 Market St., Passaic, N. J.
New York Blower Co., 3159 Shields Ave., Chicago 16, Ill.
New York Brass Foundry, 405 Broome St., New York 13, N. Y.
Newage International, Inc., Bala Cynwyd, Pa.
Newark Controls Co., 15 Ward St., Bloomfield, N. J.
Newark Wire Cloth Co., 351 Verona Ave., Newark 4, N. J.
Newcomb-Detroit Co., 5741 Russell St., Detroit 11, Mich.
Newman Industries (America) Inc., 43 Brost St., New York 4, N. Y.
Newport Steel Corp., Ninth & Lowell Sts., Newport, Ky.
Niagara Blower Co., 405 Lexington Ave., Room 3117, New York 17.
Niagara Machine & Tool Wks., 637-697 Northland Ave., Buffalo 11, N. Y.
Niagara Products Co., 4311 E. Thomas Rd., Phoenix, Ariz.
Nice Ball Bearing Co., 30th and Hunting Park Ave., Philadelphia 40.
Nichols Instruments Co., 1115 N. Hunter St., Baltimore 2, Md.
Nicholson & Co., W. H., 178 Oregon St., Wilkes-Barre, Pa.
Nikoh Tube Co., 5000 S. Whipple, Chicago 32, Ill.
Nobel & Brienholt, 770 S. 2nd St., W., Salt Lake City, Utah.
Noera Mfg. Co., Div. Chase Brass & Copper Co., Waterbury 20, Conn.
Nooter Corp., 1400 S. Second St., St. Louis 4, Mo.
Norgren Co., C. A., 3400 So. Elati St., Englewood, Colo.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Norman Products Co., Inc., 1150 Chesapeake Ave., Columbus, O.
Norris-Thermador Corp., 5215 S. Boyle Ave., Los Angeles 58, Calif.
Norristown Magnesia & Asbestos Co., Washington St., Norristown, Pa.
Norse Boiler Co., Inc., New Market, N. J.
North American Asbestos Corp., 141 W. Jackson Blvd., Chicago, Ill.
North American Mfg. Co., 4455 E. 71st St., Cleveland 5, O.
North American Mogul Products Co., The, Standard Bldg., Cleveland 13, O.
North American Philips Co., Inc., 750 S. Fulton Ave., Mt. Vernon, N. Y.
North Shore Nameplate Co., 214-27 Northern Blvd., Bayside, N. Y.
Northern Blower Co., 6428 Barberton Ave., Cleveland 2, O.
Northern Indiana Brass Co., 935 Plum St., Elkhart, Ind.
Northwest Lead Co., 2700 16th Ave., S. W., Seattle 4, Wash.
Norton Co., 1 New Bond, Worcester 6, Mass.
Norwalk Valve Co., South Norwalk, Conn.
Norwood Associated Engineers Inc., 904 Columbus Ave., Springfield, Mass.
Novelty Steam Boiler Wks., Inc., Clare & Kolman Sts., Baltimore 30.
Nutmeg Chemical Co., 134 Haven St., New Haven, Conn.
Nu-way Corp., The, 2416 4th Ave., Rock Island, Ill.
Nye Tool Co., 4120-30 Fullerton Ave., Chicago 39, Ill.

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OPW Corp., 2735 Colerain Ave., Cincinnati 25, O.
Oakite Products, Inc., 19 Rector St., New York 6, N. Y.
Obear & Son, W. F., 940 W. Florence Ave., P. O. Box 406, Inglewood 1, Calif.
Oberdorfer Foundries, Inc., 3007 Thompson Rd., Syracuse, N. Y.
O'Brien Steam Specialty Co., Inc., P. O. Box 217, Eastwood Station, Syracuse 6, N. Y.
Octagon Process, Inc., 15 Bank St., Staten Island 1, New York
Octagon Ventilator Co., 5828-30 S. Oakley Ave., Chicago 36, Ill.
Ohio Brass Co., 380 N. Main St., Mansfield, O.
Ohio Electric Mfg. Co., The, 5400 Dunham Rd., Maple Heights, O.
Ohio Foundry & Mfg. Co., Penn R. R. & Slack St., Steubenville, O.
Ohio Injector Co., 275 Main St., Wadsworth, O.
Ohio Pipe Bending & Machine Co., 3900 Trent Ave., Cleveland 9, O.
Ohio Valley Hardware & Roofing Co., Evansville, Ind.
Ohmlac Paint & Refining Co., Inc., 41-40 Crescent Ave., Long Island City, N. Y.
Oil Equipment Mfg. Corp., 75 Brewster St., New Haven, Conn.
Okadee Co., 322 S. Michigan, Chicago, Ill.
Olin Mathieson Chemical Corp., Metals Div., 505 Park Ave., New York.
Olsen Mfg. Co., C. A., Elyria, O.
Olsen Testing Machine Co., Tinius Easton Rd., Willow Grove, Pa.
Olson & Co., Arthur A., Broad St., Canfield, O.
Omega Machine Co., Div. of B-I-F Industries, Inc., 381 Harris Ave., Providence 1, R. I.
O'Neil-Irwin Mfg. Co., 541 Eighth, Lake City, Minn.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Ormsby-Osterman, Inc., 3631 Cass Ave., St. Louis 13, Mo.
Orr & Sembower, Inc., Box 1138, Reading, Pa.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14, O.
Oster Mfg. Co., Box 4326, Cleveland 32, O.
Oster Mfg. Co., John, 5055 N. Lydell Ave., Milwaukee 17, Wis.
OverHead Heaters Inc., 1612 Book Bldg., Detroit 26, Mich.
Owens Co., H., 9300 Venice Blvd., Culver City, Calif.
Owens & Co., Inc., Henry, 51 Washington Ave., Cranston 7, R. I.
Owens-Corning Fiberglas Corp., 1911 Nicholas Bldg., Toledo 1, O.
Oxy Catalyst, Inc., Wayne, Pa.
Oxygen Equipment & Service Co., 8335 S. Halsted St., Chicago 20.
Ozalid Div. of General Aniline & Film Corp., 1505 Ansco Rd., Johnson City, N. Y.

P

P-K Industries, Inc., 27 Porete Ave., North Arlington, N. J.
Pabco Products Inc., 475 Brannan St., San Francisco 19, Calif.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pacific Lumber Co., The, 100 Bush St., San Francisco 4, Calif.
Pacific Pumping Co., 9201 San Leandro Blvd., Oakland, Calif.
Pacific States Felt & Mfg. Co., Inc., 845 Howard St., San Francisco.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., 944 Ash St., Johnstown, Pa.
Pacific Transducer Corp., 11836 W. Pico Blvd., Los Angeles 64, Calif.
Pacific Tube Co., 5710 Smithway St., Los Angeles 22, Calif.
Packard Electric Div., General Motors Corp., Warren, O.
Packless Metal Hose, Inc., 31-12 Winthrop Ave., New Rochelle, N. Y.
Page Steel & Wire, Div. of American Chain & Cable Co., Inc., Monessen, Pa.
Paine Co., 2 Westgate Rd., Addison, Ill.
Paley Mfg. Corp., 244 Herkimer St., Brooklyn 16, N. Y.
Palmer Electric Co., Inc., 230 E. Alexandrine, Detroit 1, Mich.
Palmer Mfg. Corp., 2200 W. Fillmore St., Phoenix, Ariz.

Palmer Thermometers, Inc., 2501 Norwood Ave., Cincinnati (Norwood) 12, O.
Pangborn Corp., 400 Pangborn Blvd., Hagerstown, Md.
Pantex Mfg. Corp., Hydraulics Div., Pawtucket, R. I.
Paragon Electric Co., 1609 Twelfth St., Two Rivers, Wis.
Paragon-Revolute Corp., 61 South Ave., Rochester 4, N. Y.
Parker, Sid E., 2035 E. 37th St., Los Angeles, Calif.
Parker Appliance Co., The, 17325 Euclid Ave., Cleveland 12, O.
Parker Boiler Mfg. Co., Sid E., 2035 E. 37th St., Los Angeles 58, Calif.
Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.
Parks-Cramer Co., P. O. Box 444, Fitchburg, Mass.
Parsons Co., Div. of Koehring Co., 200 N. 8th Ave., E., Newton, Ia.
Patco Mfg. Co., 231 N. Bread St., Philadelphia, Pa.
Patterson-Kelley Co., Inc., The, 730 Burson St., East Stroudsburg, Pa.
Paul-Lewis Laboratories, Inc., 4253 N. Port Washington Rd., Milwaukeee 12, Wis.
Paul Valve Corp., 683 Third Ave., New York 17, N. Y.
Payne Div. of Carrier Corp., 700 Royal Oaks Dr., Monrovia, Calif.
Peabody Engineering Corp., 580 Fifth Ave., New York 36, N. Y.
Pease Co., C. F., The, 2601 W. Irving Park Rd., Chicago 18, Ill.
Peck, Stow & Wilcox Co., Center St., Southington, Conn.
Pecora Paint Co., Inc., 4th St., and Penna. R. R., Philadelphia 40, Pa.
Peden Equipment Co., 4512 Mt. Vernon, Houston, Tex.
Pedrick Tool & Machine Co., 3640 N. Lawrence St., Philadelphia 40, Pa.
Peer, Inc., 1440 Milton St., Benton Harbor, Mich.
Peerless of America, Inc., 5830 N. Pulaski Rd., Chicago 30, Ill.
Peerless Electric Co., 1401 W. Market St., Warren, O.
Peerless Heater Co., The, Div. of The Eastern Foundry Co., Boyertown, Pa.
Peerless Mfg. Corp., 14th & Ormsby, Louisville 10, Ky.
Peerless Products Div., United Cooling Towers, Inc., 1421 E. Washington Ave., North Little Rock, Ark.
Peerless Pump Div., Food Machinery & Chemical Corp., 301 West Ave. 26, Los Angeles 31, Calif.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., 1242 Holden Ave., Detroit 3, Mich.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Penn Brass & Copper Co., 3800 W. 20th St., Erie, Pa.
Penn Controls, Inc., P. O. Box 556, Goshen, Ind.
Penn Galvanizing Co., 2201 E. Tioga St., Philadelphia 34, Pa.
Penn Industrial Instrument Div. of Burgess-Manning Co., 4110 Haverford Ave., Philadelphia 4, Pa.
Penn Mfg. Corp. of Washington, Pa., 380 W. Chestnut St., P. O. Box 484, Washington, Pa.
Penn Ventilator Co., 3252 Goodman, Philadelphia 40, Pa.
Pennsylvania Engineering Corp., 526 S. Jefferson St., New Castle, Pa.
Pennsylvania Flexible Metallic Tubing Co., 72nd St. & Powers Lane, Philadelphia 42, Pa.
Pennsylvania Forge Co., Milnor & Bleigh Sts., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pennsylvania Salt Mfg. Co., Three Penn Center Plaza, Philadelphia 2, Pa.
Perfect Circle Corp., Hagerstown, Ind.
Perfecting Service Co., 332 Atlando Ave., Charlotte, N. C.
Perfection Industries Div., Hupp Corp., 7609 Platt Ave., Cleveland 4, O.
Perkins & Son, Inc., B. F., Chicopee St., Holyoke, Mass.
Permacrete Products, 1839 South Wall, Columbus, O.
Permatex Co., Inc., P. O. Box 1, Brooklyn 35, N. Y.
Permutit Co., The, 330 W. 42nd St., New York 36, N. Y.
Perolin Co., Inc., The, 1112 W. 37th St., Chicago 9, Ill.
Peters-Dalton, Inc., 17900 Ryan Rd., Detroit 12, Mich.
Petro, 3170 W. 106th St., Cleveland 11, O.
Petroleum Solvents Corp., 331 Madison Ave., New York 17, N. Y.
Phelps Dodge Copper Products Corp., British American Tube Div., 40 Wall St., New York 5, N. Y.
Phelps Mfg. Co., 715 Thomas St., Little Rock, Ark.
Pheoll Mfg. Co., 5700 Roosevelt Rd., Chicago 50, Ill.
Philadelphia Gear Works, Inc., Erie Ave. & G St., Philadelphia 34, Pa.
Philadelphia Pipe Bending Co., 4135-65 N. Fifth St., Philadelphia 40.
Philadelphia Pump and Machinery Co., Inc., 1513 Race St., Philadelphia, Pa.
Philadelphia Thermometer Co., 6th & Cayuga St., Philadelphia 40, Pa.
Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Phillips & Co., H. A., 3255 W. Carroll Ave., Chicago 24, Ill.
Phillips Cooling Tower Co., Inc., 220 Dupont St., Brooklyn 22, N. Y.
Phillips Drill Co., U. S. No. 12 & Liberty Trail, Michigan City, Ind.
Phoenix Brass Fittings Corp., 354-378 Coit St., Irvington 11, N. J.
Phoenix Iron & Steel Co., Phoenixville, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Phoenix Products Co., 4715 N. 27th St., Milwaukee 16, Wis.
Pick Mfg. Co., West Bend, Wis.
Pierce Co., Wm. B., The, 277 Military Rd., Buffalo 7, N. Y.
Piezo Mfg. Corp., 250 Arlington Ave., Staten Island, N. Y.
Pilley Brush Co., Fort Madison, Ia.
Pines Engineering Co., Inc., 685 Walnut St., Aurora, Ill.
Pioneer Furnace Co., 3131 San Fernando Rd., Los Angeles, Calif.
Pioneer Pump Div., Detroit Harvester Co., 14300 Tireman Ave., Detroit 28, Mich.
Pioneer Roofing & Sheet Metal Co., 226 N. Main St., Muskogee, Okla.
Pioneer Tool Co., 908 10th St., Racine, Wis.
Pioneer Water Heater Corp., 3131 San Fernando Rd., Los Angeles, Calif.
Pipe Line Development Co., 5700 Detroit Ave., Cleveland 2, O.
Pipe Plugs, Inc., Wellington, O.
Piping Specialties, Inc., 114 Liberty St., New York 6, N. Y.
Pittsburgh Brass Mfg. Co., 3155 Penn Ave., Pittsburgh 1, Pa.
Pittsburgh Chemical Laboratories, Inc., 715 Penn Ave., Pittsburgh.
Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22, Pa.
Pittsburgh Lectrodryer Corp., 327 32nd St., Pittsburgh 30, Pa.
Pittsburgh Nipple Wks., Inc., 1455 Spring Garden Ave., Pittsburgh 12, Pa.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna Pittsburgh 23, Pa.
Pittsburgh Piping & Equipment Co., 158 49th St., Pittsburgh 1, Pa.
Pittsburgh Plate Glass Co., 632 Ft. Duquesne Blvd., Pittsburgh 22, Pa.
Pittsburgh Steel Co., 800 Grant Bldg., Pittsburgh, Pa.
Pittsburgh Tube Co., 212 Wood St., Pittsburgh 22, Pa.
Pittsburgh Valve Co., Reedsville, W. Va.
Pittsfield Products, Inc., 2275 Platt Rd., Ann Arbor, Mich.
Plasteel Products Corp., McAdam Ave., Washington, Pa.
Plastergon Wall Board Co., Philadelphia Ave., Buffalo 7, N. Y.
Plastex Corp., 402 Mt. Vernon Ave., Columbus 3, Ohio.
Plastic Products Co., 6467 Georgia Ave., Detroit 11, Mich.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, 10400 Aviation Blvd., Los Angeles 45, Calif.
Plibrico Co., 1800 Kingsbury St., Chicago 14, Ill.
Plummer Spray Equipment Co., 700 Filmore St., Napoleon, O.
Poe Co., C. W., The, 10526 Wilbur Ave., Cleveland 6, O.
Pokorney Mfg. Co., 3117 Clybourn Ave., Chicago, Ill.
Polis Mfg. Co., J. D., 2900-20 W. 26th St., Chicago 23, Ill.
Polyken Products, Dept. of the Kendall Co., 222 W. Adams St., Chicago 6, Ill.
Polymer Corp. of Pa., The, Reading, Pa.
Poole Foundry & Machine Co., 1700 Union Ave., Woodberry, Baltimore 11, Md.
Porce-Lin Tank Lining Co., 456 Milwaukee, Detroit, Mich.
Porous Plastic Filter Co., Glen Cove, N. Y.
Portable Electric Tools, Inc., 320 W. 83rd St., Chicago 20, Ill.
Porter-Cable Machine Co., 1714 N. Salina St., Syracuse 8, N. Y.
Porter & Co., Inc., H. W., 825 Frelinghuysen Ave., Newark 5, N. J.
Portmar Boiler Co., Inc., 193 Seventh St., Brooklyn 15, N. Y.
Potter & Brumfield Sales Co., Princeton, Ind.
Potter Company, The, 1950 Sheridan Rd., North Chicago, Ill.
Potts Co., Horace T., Erie Ave. & "D" St., Philadelphia 34, Pa.
Potts-Farrington Co., 4250 Wissahickon Ave., Philadelphia 29, Pa.
Powder Power Tool Corp., 7526 S. W. Macadam Ave., Portland 1, Ore.
Powell Co., Wm., The, 2525 Spring Grove Ave., Cincinnati 22, O.
Power Engineering Co., 205 West Wacker Dr., Chicago 6, Ill.
Powers Regulator Co., 3400 Oakton St., Skokie, Ill.
Prat-Daniel Corp., 2 Meadow St., South Norwalk, Conn.
Pratt Co., Henry, 222 S. Halsted St., Chicago, Ill.
Precision Thermometer & Instrument Co., 1506 Brandywine St., Philadelphia 30, Pa.
Precision Welder Mfg. Co., 660 W. Grand Ave., Chicago, Ill.
Preferred Utilities Mfg. Corp., 1860 Broadway, New York 23, N. Y.
Prepo Corp., Edgerton, Wis.
Presstite Engineering Co., 3900 Chouteau Ave., St. Louis 10, Mo.
Pressure Airduct Corp., 8130 N. St. Louis, Skokie, Ill.
Price Brothers, E. Monument Ave., Dayton, O.
Primor Products, Inc., 2011 W. Beecher Rd., Adrian, Mich.
Pritchard & Co. of California, J. F., 4625 Roanoke Parkway, Kansas City 12, Mo.
Process Development, Inc., Genoa, O.
Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.
Producers & Distributors, Inc., 1321 Hanover Ave., Allentown, Pa.
Production Stamping Co., 2316 S. 24th St., Omaha, Nebr.
Products Planning Co., Grant Bldg., Pittsburgh 19, Pa.
Products Research Co., 3126 Los Feliz Blvd., Los Angeles 39, Calif.
Propellair Div., Robbins & Myers Inc., 1345 Lagonda Ave., Springfield, O.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., 381 Harris Ave., Providence, R. I.
Protective Closures Co., 2207 Elmwood Ave., Buffalo 22, N. Y.
Proto Tool Co., 2209 Santa Fe Ave., Los Angeles, Calif.
Prox Company, Inc., Frank, 1201 S. First St., Terre Haute, Ind.
Puhl & Hepper Mfg. Co., Inc., 6400 W. Florissant Ave., St. Louis 20.
Pullman Vacuum Cleaner Co., 25 Buick St., Boston 19, Mass.
Pumpenbau Brugg K. Rutschi, Brugg, Switzerland
Punch-Lok Co., 321 N. Justine St., Chicago 7, Ill.
Pur Air Div., Barnebey-Cheney Co., N. Cassady at 8th, Columbus 19, O.
Pure Carbonic Co., Div. of Air Reduction Co., Inc., 60 E. 42nd St., New York 17, N. Y.
Purolator Products, Inc., 970 New Brunswick Ave., Rahway, N. J.
Pyle-National Co., The, 1373 N. Kostner Ave., Chicago 51, Ill.
Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago 7, Ill.
Pypon Co., 410 Frick Bldg., Pittsburgh 19, Pa.
Pyrene CO TWO, U. S. Route 1, Newark, N. J.
Pyrolite Products Co., 1221-1231 W. 74th St., Cleveland 2, O.

Q

Q-P Mfg. Co., Needham Heights, Mass.
Quaid Fabrications, Inc., 157-167 W. Oxford St., Philadelphia 22, Pa.
Quaker City Iron Wks., Allegheny & Tulip St., Philadelphia 34, Pa.
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Comly & Milnor Sts., Philadelphia 24, Pa.
Quality Specialty Co., Inc., 28th & Lincoln Ave., Camden 5, N. J.
Quickdraft Co., Dueber-Hampden Bldg., P. O. Box 87-K, Canton, O.
Quick Joint Div., Automatic Bending Co., 469 E. 159th St., Harvey, Ill.
Quickwork Div., Whiting Corp., Harvey, Ill.
Quiet Automatic Oil Burner Corp., 33 Bloomfield Ave., Newark 4, N. J.
Quiet-Heet Mfg. Corp., 46 Oliver St., Newark 5, N. J.
Quigley Co., Inc., 527 Fifth Ave., New York 17, N. Y.

R

R C S Tool Corp., P. O. Box 1434, Joliet, Ill.
R.K.L. Valve & Mfg. Co., 1623 Elaine St., Philadelphia 19, Pa.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Radex Corp., 2076 N. Elston Ave., Chicago 14, Ill.
Radiant Baseboard Panels, Inc., 464 Hartford Ave., Newington, Conn.
Radiant Devices, 4030 Chouteau Ave., St. Louis, Mo.
Radiant Heat & Cooling Co., 795 Kifer Rd., Santa Clara, Calif.
Radiant Panel Mfg. Co., 9 E. Pearl St., Torrington, Conn.
Radiant-Ray Radiation, Inc., Newington, Conn.
Radiant Utilities Corp., 8817-18th Ave., Brooklyn 14, N. Y.
Radiator Specialty Co., 1700-1900 Dowd Rd., Charlotte 1, N. C.
Radio Corp. of America, RCA Victor Div., Front & Cooper, Camden, N. J.
Radio Corp. of America, Engineering Products Dept., Camden, N. J.
Radioactive Products, Inc., 2421 Wolcott Ave., Ferndale 20, Mich.
Raisler Corp., Grimes Sprinkler Div., 129 Amsterdam Ave., New York 23, N. Y.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., 12117 Berea Rd., Cleveland 11, O.
Ramsey Chain Co., Inc., 1029 Broadway, Albany 1, N. Y.
Ramtite Co., The, 2563 W. 18th St., Chicago 8, Ill.
Randall Graphite Bearings, Inc., Greenlawn & Lake Sts., Lima, O.
Randolph-Page, Inc., 175 Fifth Ave., New York 10, N. Y.
Ransome Co., 4030 Hollis St., Emeryville, Calif.
Ravena Iron Co., Ravena, N. Y.
Rawplug Co., Inc., The, 271 Church St., New York 13, N. Y.
Ray Oil Burner Co., 1301 San Jose Ave., San Francisco 12, Calif.
Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.
Rayfield-Staffco Burner Co., 2066 Canalport, Chicago 8, Ill.
Raymond Div., Combustion Engineering, Inc., 1324 N. Branch St., Chicago, Ill.
Raypak Co., Inc., 4560 Worth St., Los Angeles, Calif.
Raytheon Mfg. Co., Waltham 54, Mass.
Read Standard Corp., Blower-Stoker Div., 901 S. Richard St., York, Pa.
Reading Tube Corp., 350 - 5th Ave., New York, N. Y.
Ready Power Co., The, 11231 Freud Ave., Detroit 14, Mich.
Reco Products Div., Recony Corp., 150 Nassau St., New York 38, New York.
Rector Mineral Trading Corp., 551 Fifth Ave., New York 17, N. Y.
Red Jacket Co., Inc., 513 Bell Ave., Carnegie, Pa.
Red Spot Electric Co., 7405 S. Tacoma Way, Tacoma 9, Wash.
Redi-Bolt, Inc., 5334 Indianapolis Blvd., East Chicago, Ind.
Redmond Co., Inc., Owosso, Mich.
Ree Associates, Bogota, N. J.
Reed Mfg. Co., 1425 W. 8th St., Erie, Pa.
Reed Unit-Fans, Inc., 1001 St. Charles Ave., New Orleans 8, La.
Reeves Pully Co., Columbus, Ind.
Reeves Steel & Mfg. Co., Dover, O.
Reflectal Corp. Subsid., Borg-Warner Corp., 310 S. Michigan Ave., Chicago 4, Ill.
Reflectotherm, Inc., 26 East Unversity Ave., Cincinnati 19, O.
Reflin Co., Highway 395, San Diego, Calif.
Refractory & Insulation Corp., 120 Wall St., New York 5, N. Y.
Refrigeration Appliances, Inc., 917-923 W. Lake St., Chicago, Ill.
Refrigeration Devices Co., 51 E. Centre St., Nutley 10, N. J.
Refrigeration Engineering Inc., 7250 E. Slauson Ave., Los Angeles 22.
Rega Mfg. Co., 79 Mt. Hope Ave., Rochester 20, N. Y.
Register & Grille Mfg. Co., Inc., 70 Berry St., Brooklyn 11, N. Y.
Reichert Float & Mfg. Co., 2242 Smead Ave., Toledo 6, O.
Reif-Rexoil, Inc., 37-41 Carroll St., Buffalo 3, N. Y.
Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis 4, Ind.
Reiner & Campbell Co., Inc., 19 Euclid Ave., P. O. Box 5035, Newark 5, N. J.
Reintjes Co., Geo. P., 2517-19 Jefferson St., Kansas City, Mo.
Reliable Perforating Co., 2047 N. Wood St., Chicago, Ill.
Reliance Automatic Lighting Co., 1929 Mead St., Racine, Wis.
Reliance Electric & Engineering Co., 1058 Ivanhoe Rd., Cleveland 10.
Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland 3, O.
Reliance Refrigerating Machine Co., 3401 N. Kedzie Ave., Chicago.
Remco, Inc., Zelienople, Pa.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Remington Arms Co., Inc., Bridgeport, Conn.
Rempe Co., 342 N. Sacramento Blvd., Chicago 12, Ill.
Republic Flow Meters Co., 2240 Diversey Pkwy., Chicago 47, Ill.
Republic Mfg. Co., 15655 Brookpark Rd., Cleveland 11, O.
Republic Products Co., 7420 State Rd., Philadelphia 36, Pa.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown 1, O.
Republic Steel Corp., Republic Bldg., Cleveland 1, O.
Republic Steel Corp., Bolt & Nut Div., 1970 Carter Rd., Cleveland 13.
Republic Steel Corp., Steel & Tubes Div., 224 E. 131st St., Cleveland 8, O.
Research Appliance Co., 143 Cemetery Lane, Pittsburgh 9, Pa.
Research Products Corp., 1015 E. Washington Ave., Madison 10, Wis.
Research Vacuum Supply Co., 6712 N. Clark St., Chicago 26, Ill.
Resisto Pipe & Valve Co., 262 Bridge St., East Cambridge, Mass.
Resistoflex Corp., Belleville 9, N. J.
Reuland Electric Co., 3001 W. Mission Rd., Alhambra, Calif.
Revcor, Carpentersville, Ill.
Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
Rex Clay Products Co., 14414 Dexter Blvd., Detroit, Mich.
Rex Welder Company, 409 Southwest Blvd., Kansas City 8, Mo.
Reynolds Electric Co., 3000 River Rd., River Grove, Ill.
Reynolds Mfg. Co., The, Box 333, Comstock Park, Mich.
Reynolds Mfg. Co., Inc., Springfield, Mo.
Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.
Reynolds Shaffer Co., 12100 Cloverdale Ave., Detroit 4, Mich.
Reznor Mfg. Co., 51 Union St., Mercer 8, Pa.
Rheem Mfg. Co., 7600 Kedzie Ave., Chicago 29, Ill.
Rhoads & Sons, J. E., 2100 W. 11th St., Wilmington 99, Del.
Rhode Island Fittings Co., 355 Dexter St., Providence 7, R. I.
Rhode Island Humidifier & Ventilating Co., 99 Chauncy St., Boston 11, Mass.
Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford, Conn.
Rich Fan Mfg. Co., Inc., Phil, 2900 Caroline St., Houston 4, Tex.
Richland Co., 104 Ausdale Ave., P. O. Box 219, Mansfield, O.
Richmond Engineering Co., 7th and Hospital Sts., Richmond, Va.
Richmond Foundry & Mfg. Co., Inc., The, Hermitage Rd., Richmond, Va.
Richmond Radiator Co., Box 111, Metuchen, N. J.
Richmont, Inc., 922 S. Myrtle Ave., Monrovia, Calif.
Ric-wiL, Inc., Barberton, O.
Ridge Tool Co., Clark St., Elyria, O.
Rid-Sludge Div., Aulwood Mfg. Co., 777 Raymond Ave., St. Paul, Minn.
Rigidbilt Inc., 2850 W. Fulton St., Chicago 12, Ill.
Rigidized Metals Corp., 721 Ohio St., Buffalo 3, N. Y.
Riley Stoker Corp., 9 Neponset St., Worcester, Mass.
Rinehart Inc., 511-513 Main St., Richmond, Ind.
Ripley Co., Inc., Middletown, Conn.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Rite Engineering & Mfg. Corp., 144 S. Mission Rd., Los Angeles, Calif.
Ritter Pattern & Casting Co., Inc., 120 Walker St., New York 13, N. Y.
Rittling Corp., The, Rittling Bldg., Buffalo 5, N. Y.
Riverside Boiler & Engineering Co., Inc., 4725 N. E. 28th, P. O. Box 7141, Ft. Worth, Tex.
Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield, O.
Robbins & Myers, Inc., Fan Div., 387 S. Front St., Memphis, Tenn.
Roberson Co., L. N., 1539 E. 103rd St., Seattle 55, Wash.
Robert Mfg. Co., 9035 Venice Blvd., Los Angeles 34, Calif.
Roberts-Gordon Appliance Corp., 44 Central Ave., Buffalo 6, N. Y.
Roberts Tube Works, 2500 Military Ave., Detroit 9, Mich.
Robertson Co., H. H., 2400 Farmers Bank Bldg., Pittsburgh 22, Pa.
Robinson Aviation, Inc., Teterboro Air Terminal, Teterboro, N. J.
Robinson Clay Product Co., The, 65 W. State St., Akron 9, O.
Robinson Corp., 120 Valley Rd., Roselle Park, N. J.
Robinson Industries, Coleman, Mich.
Robinson Ventilating Co., Zelionople, Pa.
Robvon Backing Ring Co., 675 Garden St., Elizabeth 2, N. J.
Rochester Lead Works, Inc., 380 Exchange St., Rochester 8, N. Y.
Rochester Mfg. Co., Inc., 63 Rockwood St., Rochester 10, N. Y.
Rock Island Register Co., 2435 Fifth Ave., Rock Island, Ill.
Rockford Brass Works, 700 S. Main, Rockford, Ill.
Rockford Screw Products Co., 2501 Ninth St., Rockford, Ill.
Rockwell Co., W. S., 2545 Eliot St., Fairfield, Conn.
Rockwell Mfg. Co., Meter & Valve Div., 400 N. Lexington Ave., Pittsburgh 8, Pa.
Rockwood Sprinkler Co., 38 Harlow St., Worcester 5, Mass.
Roddick Tool Co., P. O. Box 109, Anaheim, Calif.
Roessing Mfg. Co., 1616 Noble St., Sharpsburg, Pittsburgh 15, Pa.
Roller Bearing Co. of America, Sullivan Way, West Trenton, N. J.
Rome-Turney Radiator Co., Canal St., Rome, N. Y.
Ronor Corp., 1360 W. 9th St., Cleveland 13, O.
Roots-Connersville Blower Div., 900 W. Mount St., Connersville, Ind.
Roper Corp., Geo. D., Blackhawk Park Ave., Rockford, Ill.
Rosebraugh Co., W. W., 680 S. 17th St., Salem, Ore.
Rosedale Foundry & Machine Co., Columbus & Preble Aves., N. S., Pittsburgh, Pa.
Ross Engineering Corp., J. O., 444 Madison Ave., New York 22, N. Y.
Ross Sprinkler Co., 4333 Temple City Blvd., Rosemead, Calif.
Ross Valve Mfg. Co., Inc., 6 Oakwood Ave., Troy, N. Y.
Rotary Concrete Drill Co., 650 S. Arroyo Pkwy., Pasadena, Calif.
Rotary Seal Co., 2020 N. Larrabee St., Chicago 14, Ill.
Roth Co., Roy E., 2420-A 24th Ave., Rock Island, Ill.
Rotometals, 980 Harrison St., San Francisco 7, Calif.
Rotor Tool Co., 26300 Lakeland Blvd., Cleveland 32, O.
Round Oak Co., Inc., Dowagiac, Mich.
Royal Jet, Inc., 1024 Westminster Ave., Alhambra, Calif.
Royal Mfg. Corp., Waterloo, Ind.
Royalton Co., Inc., Gasport, N. Y.
Royersford Foundry & Machine Co., Inc., 101-131 Main St., Royersford, Pa.
Roylyn, Inc., 1706 Standard Ave., Glendale 1, Calif.
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Rubber & Asbestos Corp., 225 Belleville Ave., Bloomfield, N. J.
Rubber & Plastics Compound Co., 30 Rockefeller Plaza, New York 20, N. Y.
Ruberoid Co., 500 Fifth Ave., New York 18, N. Y.
Ruby Chemical Co., 74 McDowell St., Columbus 16, O.
Ruemelin Mfg. Co., 3860 N. Palmer St., Milwaukee 12, Wis.
Ruggles-Klingemann Mfg. Co., 110 Tremont St., Boston, Mass.
Ruppright's Rotary Roof Cooler, Box 6795, Los Angeles 22, Calif.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Russell Co., F. C., The, 1100 Chester Ave., Clevelend 1, O.
Rust-Oleum Corp., 2425 Oakton St., Evanston, Ill.
Ruthman Machinery Co., 1809 Reading, Cincinnati, O.
Rutland Fire Clay Co., Curtis Ave., Rutland, Vt.
Ruud Mfg. Co., Kalamazoo, Mich.
Ryerson & Son, Inc., Joseph T., 2558 W. 16th, Chicago, Ill.

S

S&C Mfg. Co., 6245 Wiehe Rd., Cincinnati, O.
SKF Industries, Inc., Front St., & Erie Ave., Philadelphia 32, Pa.
S.O.S. Products Co., Inc., 346 Cumberland St., Brooklyn 38, N. Y.
Sac Tool Mfg. Co., 1913 Washington Ave., St. Louis 3, Mo.
St. Clair Rubber Co., 440 E. Jefferson, Detroit, Mich.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., 1948 N. 9th St., St. Louis 6.

St. Louis Tool Co., 6100 Prescott St., St. Louis 15, Mo.
St. Paul Corrugating Co., S. Wabasha and Water Sts., St. Paul 1.
Sales & Co., Murray W., 801 W. Baltimore Ave., Detroit 2, Mich.
Salina Metal Products Co., 9th and Bishop, Salina, Kan.
Sall Bros. Co., 2320 Kishwaukee St., Rockford, Ill.
Sall Mountain Co., Box 777, Hamilton, O.
Salsbury Corp., 1161 E. Florence Ave., Los Angeles 1, Calif.
Sampson Chemical & Pigment Corp., 2830 W. Lake St., Chicago 12, Ill.
San Angelo Foundry & Machine Co., P. O. Box 1152, San Angelo, Tex.
San Gabriel Boiler Mfg. Co., 330 S. Del Mar Ave., San Gabriel, Calif.
Sandee Mfg. Co., 5050 W. Foster Ave., Chicago, Ill.
Sandstrom Products Co., Port Byron, Ill.
Sangamo Electric Co., 1301 N. 11th St., Springfield, Ill.
Santa Fe Tank & Tower Co., Inc., 5401 S. Boyle Ave., Los Angeles 11.
Santa Fe Tank & Tower Co. of Texas, P. O. Box 278, Garland, Tex.
Saran Lined Pipe Co., 2415 Burdette Ave., Ferndale 20, Mich.
Sarco Co., Inc., Empire State Bldg., New York 1, N. Y.
Sarcotherm Controls, Inc., Empire State Bldg., New York 1, N. Y.
Sargent Enginairing Co., 1375 E. 45th St., Cleveland 3, O.
Sauereisen Cements Co., 1045 North Canal St., Pittsburgh 15, Pa.
Saunders Mfg. Co., 25 Atherton St., Yonkers, N. Y.
Saverite Engineering Co., 158 - 14th St., Hoboken, N. J.
Sawhill Tubular Products, Inc., P. O. Box 546, Sharon, Pa.
Scaife Co., 26 Ann St., Oakmont, Pa.
Schade Valve Mfg. Co., 2527 N. Bodine St., Philadelphia 33, Pa.
Schaevitz Engineering, Camden 1, N. J.
Schaible Co., The, 1086 Summer St., Cincinnati 4, O.
Scharer & Co., Ray A., 3000 East Grand Blvd., Detroit 2, Mich.
Scharf Mfg. Co., J. H., 6120 Binney St., Omaha, Nebr.
Schatz Mfg. Co., The, Fairview, Poughkeepsie, N. Y.
Schaub Engineering Co., Fred H., 2110 S. Marshall Blvd., Chicago 23.
Schaul Mfg. Co., 6300 Rowland Ave., Cleveland 27, O.
Schecter Brothers Co., Hancock and Huntingdon Sts., Philadelphia 33.
Schemenauer Mfg. Corp., Holland, O.
Schieren Co., Chas. A., 30-38 Ferry St., New York 38, N. Y.
Schild Mfg. Co., White Rock Station, Box 11571, Dallas 18, Tex.
Schmieg Industries, Inc., P. O. Box 4701, Detroit 34, Mich.
Schnacke, Inc., 1101 N. Governor St., Evansville, Ind.
Schneible Co., Claude B., P. O. Box 81, No. End Station, Detroit 2.
Schoedinger, Inc., F. O., 322-358 Mt. Vernon Ave., Columbus 16, O.
Schramm, Inc., West Chester, Pa.
Schurs Oil Burner Co., 8500 Zamore Ave., Los Angeles 1, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Schwitzer-Cummins Co., 1125 Massachusetts Ave., Indianapolis 7, Ind.
Sciaky Bros. Inc., 4915 W. 67th St., Chicago 38, Ill.
Scientific Instrument Co., 1041 Second Ave., Detroit 26, Mich.
Scott Valve Mfg. Co., 3963 McKinley Ave., Detroit 8, Mich.
Scovill Mfg. Co., Waterville Div., Waterville 14, Conn.
Screw Machine Products Co., 7737 N. E. Killingsworth, Portland 20, Ore.
Scully Signal Co., 174 Green St., Melrose 76, Mass.
Sealed Power Corp., 2001 Sanford St., Muskegon 61, Mich.
Sealed Unit Parts Co., Inc., 261 E. 161st St., Bronx 51, N. Y.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., 47 Ridgeway Ave., Aurora, Ill.
Sealol Corp., Warwick Industrial Park, Providence 5, R. I.
Seamless Rubber Co., The, F.O.S. Industrial Tape Div., 464 Congress Ave., New Haven 3, Conn.
Seamlex Co., Inc., 41-23 24th St., Long Island City 1, N. Y.
Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Ill.
Security Valves Corp., 541 W. Garfield, Glendale, Calif.
Seelye Craftsman, 984 Central Ave., Minneapolis, Minn.
Seiberling Rubber Co., Plastics Div., Newcomberstown, O.
Selas Corp. of America, Erie Ave. and D St., Philadelphia 34, Pa.
SelecTemp Div., Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland 11, O.
Self Cleaning Strainer Co., 4545 Southwest Highway, Oak Lawn, Ill.
Sellers Engineering Co., 4874-76 N. Clark St., Chicago 40, Ill.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
Servel, Inc., 119 Morton Ave., Evansville 20, Ind.
Service To Industry, Box 133, West Hartford, Conn.
Seton Name Plate Co., 394-B Central Ave., New Haven 15, Conn.
Shafer Bearing, Div. of Chain Belt Co., 801 Burlington Ave., Downers Grove, Ill.
Shakeproof Div., Illinois Tool Wks., St. Charles Rd., Elgin, Ill.
Shallcross Co., 48th and Grays Ferry Rd., Philadelphia 43, Pa.
Shallcross Controls, Inc., 2217-21 N. 31st St., Milwaukee 8, Wis.
Shank Co., Cyrus, 4646 W. 12th Pl., Chicago 50, Ill.
Sharon Steel Corp., Sharon, Pa.
Shaw Co., Benjamin F., Second & Lombard Sts., Wilmington 99, Del.
Shaw-Kendall Engineering Co., 128 S. Superior St., Toledo 4, O.
Shaw-Perkins Mfg. Co., 201 E. Carson St., Pittsburgh 19, Pa.
Sheldon Equipment Co., E. H., 716 Nims St., Muskegon, Mich.
Shell Oil Co., Lubricants Dept., 37-06 82nd St., Jackson Heights, Long Island, N. Y.
Shephard Heater Co., Inc., 951 Sycamore St., Terre Haute, Ind.
Sherwin-Williams Co., The, 101 Prospect Ave., N. W., Cleveland, O.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Siemon Mfg. Co., Grandview, Mo.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Sight Feed Generator Co., P. O. Box 38, West Alexandria, O.
Signal Electric Div. of King-Seeley Corp., Menominee, Mich.
Signal Indicator Co., 42 Stewart Ave., Brooklyn 37, N. Y.
Sikes Co., S. R., 1028 S. Third St., Minneapolis 15, Minn.
Silco Products, Inc., 437 Harding St., Minneapolis, Minn.
Silent Glow Oil Burner Co., 850 Windsor St., Hartford, Conn.
Silvercote Products, Inc., 161 E. Erie St., Chicago 11, Ill.
Silvercraft, Inc., 120 S. Floyd St., Louisville, Ky.
Simplaire, 521 Fifth Ave., New York 17, N. Y.
Simplex Ceiling Corp., 552 W. 52nd St., New York 19, N. Y.
Simplex Mfg. Co., 198 N. Main St., Fond du Lac, Wis.
Simplex Oil Heating Corp., 7901 Oxford, Philadelphia 11, Pa.
Simplex Valve & Meter Co., 68th and Upland Sts., Philadelphia 42, Pa.
Sims Co., 18th & Whitley Sts., Erie, Pa.
Sims Pump Valve Co., 1314 Park Ave., Hoboken, N. J.
Sioux Steel Co., P. O. Box 898, Sioux Falls, S. D.
Sipe & Co., James B., Box 8010, Pittsburgh 16, Pa.
Skidmore Corp., P. O. Box 309, St. Joseph, Mich.
Skilbeck Mfg. Co., 7432 27th Ave., Kenosha, Wis.
Skil Corp., 5033 Elston Ave., Chicago 30, Ill.
Skinner Co., M. B., 3502 W. Sample, South Bend 21, Ind.
Skinner Electric Valve Div., The Skinner Chuck Co., Edgewood Ave., New Britain, Conn.
Skinner Engine Co., 337 W. 12th St., Erie, Pa.
Skinner Irrigation Co., 121 E. Canal St., Troy, O.
Skyline Industries, Titusville, Pa.
Slant-Fin Radiator Corp., 87-49 130th St., Richmond Hill 18, N. Y.
Sly Mfg. Co., W. W., 4700 Train Ave., P. O. Box 5939, Cleveland 1, O.
Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
Smith Bros. Co., 414 S. Harvey, Oak Park, Ill.
Smith Co., Inc., H. B., The, 64 Main St., Westfield, Mass.
Smith Co., J. B., 3327 B St., Philadelphia 34, Pa.
Smith Co., S. Morgan, Lincoln & Hartley Sts., York, Pa.
Smith Corp., A. O., 3533 N. 27th St., Milwaukee 1, Wis.
Smith Corp., A. O., Electric Motor Div., 227 E. Helena, Dayton 4, O.
Smith Filter Corp., 1603-2 Ave., Moline, Ill.
Smith & Kanzler Corp., E. Linden Ave., Linden, N. J.
Smith Products Co., 43642 Nine Mile Rd., Northville 1, Mich.
Smith & Serrell, Inc., 200 Washington St., Newark 2, N. J.
Smith Twin Tubular Boiler Co., Inc., Cottman St., at State Rd., Philadelphia 35, Pa.
Smith Welding Equipment Corp., 2633 S. E. Fourth St., Minneapolis 14, Minn.
Smolensky Valve Co., Inc., 940 Broadway, Bedford, O.
Smooth-On Mfg. Co., 568-574 Communipaw Ave., Jersey City 4, N. J.
Snap-on Tools Corp., Kenosha, Wis.
Snap-Tite, Inc., Union City, Pa.
Socony-Mobil Oil Co., Inc., 26 Broadway, New York 4, N. Y.
Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill.
Solar Aircraft Co., 2200 Pacific Highway, San Diego 12, Calif.
Soldering Specialties Co., 19 Chatam Rd., Summit, N. J.
Solvay Process Div., Allied Chemical & Dye Corp., 61 Broadway, New York 6, N. Y.
Somers, Inc., H. J., 6063 Wabash Ave., Detroit 8, Mich.
Somerville Iron Works, Inc., Chattanooga, Tenn.
Sommerfield, Inc., Lou, 234 E. 128th St., New York, N. Y.
Sonneborn Sons, Inc., L., 404 Fourth Ave., New York 16, N. Y.
Sonner Burner Co., 412-420 E. 6th Ave., Winfield, Kans.
Sonoco Products Co., Hartsville, S.C.
Soreng Products Corp., 9555 Soreng Ave., Schiller Park, Ill.
South Bend Air Products, Inc., 322 E. Colfax Ave., South Bend 22, Ind.
South Chester Corp., Southco Div., Lester, Pa.
South Chester Tube Co., Front & Thurlow Sts., P. O. Box 60, Chester, Pa.
Souther Iron Co., E. E., 1952 Kienlen Ave., St. Louis 20, Mo.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Southwestern Plastic Pipe Co., P. O. Box 117, Mineral Wells, Tex.
Southworth Machine Co., 30 Warren Ave., Portland, Me.
Spang-Chalfant, Div. of The National Supply Co., P. O. Box 416, Pittsburgh 30, Pa.
Sparkler Mfg. Co., Mundelein, Ill.
Spartan Convector Co., Inc., 19 Clay St., Brooklyn 22, N. Y.
Spartan Tool Co., 1918 Columbia Ave., Chicago 26, Ill.
Speakman Co., Riverview Wks., Wilmington 99, Del.
Special Chemicals Corp., 100 S. Water St., Ossining, N. Y.
Special Screw Products, 5445 Dunham Rd., Bedford, O.
Speed Selector Inc., 118 Noble Court, Cleveland 13, O.
Speedway Mfg. Co., Div. of Thor Power Tool Co., 1834 S. 52nd Ave., Chicago (Cicero), Ill.
Speed Seam Co., 820 N. Walcott, Chicago 22, Ill.
Spence Engineering Co., Inc., 32 Grant St., Walden, N. Y.
Spencer Heater, Lycoming Div., Avco Mfg. Corp., 652 Oliver St., Williamsport, Pa.
Spencer Thermostat Div., Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
Spencer Turbine Co., 486 New Park Ave., Hartford 6, Conn.
Sperti, Faraday, Inc., 720 Grand St., Hoboken, N. J.
Spi-Rol-Fin Corp., 133 Greenwood Ave., Pequannock, N. J.
Spincraft, Inc., 4132 W. State St., Milwaukee, Wis.
Sponge Products Div., B. F. Goodrich Co., Shelton, Conn.
Sporlan Valve Co., 7525 Sussex Ave., St. Louis 17, Mo.
Sprague Electric Co., Marshall St., North Adams, Mass.
Spray Engineering Co., 114 Central St., Somerville 45, Mass.
Spraying Systems Co., 3219 Randolph St., Bellwood, Ill.
Sprayo-Flake Co., 2715 Irving Park Blvd., Chicago 18, Ill.
Spring Packing Corp., 332 S. Michigan Ave., Chicago, Ill.
Springfield Boiler Co., 1939 E. Capitol Ave., Springfield, Ill.
Springload Mfg. Corp., 3610 - 1st Ave., South, Seattle 4, Wash.
Sprout Waldron & Co., Muncy, Pa.
Spurgeon Co., 23501 Hoover Rd., Van Dyke, Mich.
Square D Co., 6060 Rivard St., Detroit 11, Mich.
Square D Co., Industrial Controller Div., 4041 N. Richards St., Milwaukee 12, Wis.
Squires Co., C. E., The, 18502 Syracuse Ave., Cleveland 10, O.
Stainless Processing Div., Wall Colmonoy Corp., 19345 John R St., Detroit, Mich.
Stainless Welded Products, Inc., 1 Clifton Blvd., Clifton, N. J.
Stalwart Rubber Co., The, 381 Northfield Rd., Bedford, O.

Stamco Inc., New Bremen, O.
Stanat Mfg. Co., Inc., 47-36 37th St., Long Island City 1, N. Y.
Standard Asbestos Mfg. Co., 860 W. Evergreen Ave., Chicago 22, Ill.
Standard Electric Mfg. Co., West Berlin, N. J.
Standard Engineering Wks., 289 Roosevelt Ave., Pawtucket, R. I.
Standard Fuel Engineering Co., 667 Post Ave., S., Detroit 17, Mich.
Standard Instrument Div., Heat Timer Corp., 657 Broadway, New York 1, N. Y.
Standard Machine & Mfg. Co., 8213-15 Gravois Ave., St. Louis 23, Mo.
Standard Oil Co. of California, 225 Bush St., San Francisco, Calif.
Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Ill.
Standard Pressed Steel Co., Box 810, Jenkintown, Pa.
Standard Refrigeration Co., 332 S. Hoyne Ave., Chicago 12, Ill.
Standard Reseater Corp., 423 W. 126th St., New York 27, N. Y.
Standard Rolling Mills, Inc., 196 Diamond St., Brooklyn 22, N. Y.
Standard Stamping & Perforating Co., 3151 W. 49th Pl., Chicago 32.
Standard Transmission Equipment Co., 70 W. Union St., Pasadena 1, Calif.
Standard Tube Co., 24400 Plymouth Rd., Detroit 39, Mich.
Stanley Electric Tools, Div. of The Stanley Works, Myrtle St., New Britain, Conn.
Stanley Works, The, 195 Lake St., New Britain, Conn.
Staples & Pfeiffer, 528 Bryant St., San Francisco 7, Calif.
Sta-Rite Products, Inc., 305 S. 8th St., Delavan, Wis.
Star Expansion Bolt Co., 142 Liberty St., New York, N. Y.
Star-Kimble Motor Div., Miehle Printing Press & Mfg. Co., 200 Bloomfield Ave., Bloomfield, N. J.
Star Stainless Screw Co., 646 Union Blvd., Paterson 2, N. J.
Star Tubular Products Co., 4747 S. Richmond St., Chicago, Ill.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Stearns Co., N. C., P. O. Box 1234, Shreveport, La.
Stedco Products, 71 Lehigh St., Wilkes-Barre, Pa.
Steel City Electric Co., 1201 Columbus Ave., Pittsburgh, Pa.
Steelcote Mfg. Co., 3418 Gratiot St., St. Louis, Mo.
Steel Products Engineering Co., The, 1205 W. Columbia St., Springfield, O.
Steinen Mfg. Co., Wm., 43 Bruen St., Newark, N. J.
Sterlairco, Inc., Westfield, Mass.
Sterling, Inc., 3744 N. Holton St., Milwaukee 12, Wis.
Sterling Air Conditioning Corp., Gastonia, N. C.
Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.
Sterling Engineering & Mfg. Corp., 114 Business St., Hyde Park 36, Mass.
Sterling Heat Specialties Inc., 260 N. Elm St., Westfield, Mass.
Sterling Radiator Co., Inc., 260 N. Elm St., Westfield, Mass.
Sterns-Flinn Corp., 30 Church St., New York 7, N. Y.
Stevens Mfg. Co., Inc., P. O. Box 1007, Mansfield, O.
Stewart Ice Machine Co., 1282 W. 1st St., Pomona, Calif.
Stewart Mfg. Co., Inc., Grove Ave., Cedar Grove, N. J.
Stewart-Warner Corp., South Wind Div., 1514 Drover St., Indianapolis, Ind.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Stickle Steam Specialties Co., 2215 Valley Ave., Indianapolis 18, Ind.
Stic-Klip Mfg. Co., Inc., 50 Regent St., Cambridge 40, Mass.
Stillwater Clay Products Co., The, 3334 Prospect Ave., Cleveland 15.
Stockham Valves & Fittings Co., Box 2592, Birmingham 2, Ala.
Stoddard Industries, Inc., 1545 N. Kingsbury, Chicago 22, Ill.
Stokes Molded Products, Taylor & Webster, Trenton 4, N. J.
Stokes Molded Products Div., The Electric Storage Battery Co., c/o Geare-Marston, Inc., 22nd & Locust Sts., Philadelphia 3, Pa.
Stout & Sons, David, 7016 Manchester Blvd., St. Louis 17, Mo.
Stover Water Softener Co., 10 State Ave., St. Charles, Ill.
Stow Mfg. Co., 445 State St., Binghamton, N. Y.
Strahman Valves, Inc., 16-22 Hudson St., New York 13, N. Y.
Stratford Pipe Scalloper Co., 1865 Harding, Clearwater, Fla.
Strong, Carlisle & Hammond Company, 1392 W. Third St., Cleveland 13, O.
Struthers-Dunn, Inc., Lamb's Rd., Pitman, N. J.
Struthers Wells Corp., Titusville, Pa.
Sturtevant Co., P. A., Addison, Ill.
Sub-Zero Freezer Co., Inc., Route 3, P. O. Box 2017, Madison, Wis.
Sudbury Laboratory, South Sudbury, Mass.
Sulflo, Inc., 1143 E. Jersey St., Elizabeth 4, N. J.
Sullivan Valve & Engineering Co., 1400 E. Second St., Butte, Mont.
Sundstrand Hydraulic Div., 2210 Harrison Ave., Rockford, Ill.
Sun-Fire Stoker Corp., New Albany, Ind.
Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa.
Sun-Ray Burner Mfg. Corp., 139-24 Queens Blvd., Jamaica 2, N. Y.
Sunwarm, Inc., P. O. Box 263, Kingsport, Tenn.
Super Radiator Corp., 6714 Walker St., St. Louis Park, Minneapolis 16, Minn.
Superior Clay Corp., The, Uhrichsville, O.
Superior Combustion Industries, Inc., Times Tower, Times Sq., New York 36, N. Y.
Superior Tube Co., Norristown, Pa.
Superior Valve and Fittings Co., 1509 W. Liberty Ave., Pittsburgh 26, Pa.
Supreme Electric Products Corp., 194 Vassar St., Rochester 7, N. Y.
Surface Chemicals, Inc., 1101 Thompson Ave., McKees Rocks, Pa.
Surface Combustion Corp., 2375 Dorr St., Toledo 1, O.
Sutton Corp., O. A., The, 1812 W. Second St., Wichita 2, Kan.
Swaby Mfg. Co., 3818 W. Armitage Ave., Chicago 47, Ill.
Swaine Mfg. Co., Fred J., 1300 N. Seventh St., St. Louis 6, Mo.
Swallow Airplane Co., Wichita, Kan.
Swartwout Co., The, 18511 Euclid Ave., Cleveland 12, O.
Swift & Co., Adhesive Products Dept., 4115 S. Packers Ave., Chicago 9, Ill.
Swift Lubricator Co., Inc., 19 James Bldg., Elmira, N. Y.
Swift Mfg. Co., Inc., 31241 Stephenson Highway, Royal Oak, Mich.
Synchronous Flame, Inc., Walworth, Wis.
Synchro-Start Products, Inc., 8151 N. Ridgeway Ave., Skokie, Ill.
Syncromatic Corp., Watertown, Wis.
Syntron Co., 161 Lexington Ave., Homer City, Pa.

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T & H Engineering Co., 399 Main St., Little Ferry, N. J.
Taber Pump Co., 272 Elm St., Buffalo 3, N. Y.
Taco Heaters, Inc., 1160 Cranston St., Cranston 9, R. I.
Tal Bender, Inc., 417 N. Water St., Milwaukee 2, Wis.
Taller & Cooper, Inc., 75 Front St., Brooklyn 1, N. Y.
Tallmadge, Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., 1700 W. 10th, Indianapolis 7, Ind.
Talon Tools, Inc., North Arlington, N. J.
Tamms Industries, Inc., 228 N. LaSalle St., Chicago 1, Ill.
Tapecoat Co., The, 1523 Lyons St., Evanston, Ill.
Taylor Co., Halsey W., 1259 N. Park Ave., Warren, O.
Taylor Forge & Pipe Wks., P. O. Box 485, Chicago 90, Ill.
Taylor Instrument Companies, 95 Ames St., Rochester 1, N. Y.
Taylor Sons Co., Charles, 710 Burns St., Cincinnati 14, O.
Taylor-Winfield Corp., 1052 Mahoning Ave., N. W., Warren, O.
Technical Ply-Wood Sales, 228 N. LaSalle St., Chicago 1, Ill.
Techniflex Corp., Port Jervis, N. Y.
Tech-Tron Corp., 2205 Haskell Ave., Lawrence, Ks.
Tecumseh Products Co., Tecumseh, Mich.
Tedd Company, The, P. O. Box 1621, Rockford, Ill.
Teleflex Incorporated, P. O. Box 69, North Wales, Pa.
Temco, Inc., 4101 Charlotte, Nashville, Tenn.
Templeton Bros., 177 Reservation Rd., Hyde Park 36, Mass.
Tempmaster Corp., 1338 McGee St., Kansas City, Mo.
Tempo Products Co., 2075 E. 65th St., Cleveland, O.
Temprite Products Corp., Dept. HPAC, E. Maple Rd., Birmingham, Mich.
Tenco, Inc., 51 Walnut St., Winona, Minn.
Tenite Plastics Div., Eastman Chemical Products, Inc., Kingsport, Tenn.
Tennessee Coal & Iron Div., United States Steel Corp., P. O. Box 599, Fairfield, Ala.
Tennesse Products and Chemical Corp., First American National Bank Bldg., Nashville, Tenn.
Tenney Engineering, Inc., 1090 Springfield Rd., Union N. J.
Termite Drills, Inc., 90 N. Lotus Ave., Pasadena 8, Calif.
Terre Haute Boiler Works Co., 1140 Crawford, Terre Haute, Ind.
Terry Steam Turbine Co., The, P. O. Box 1200, Hartford 1, Conn.
Texas Co., The, 135 E. 42nd St., New York 17, N. Y.
Texas Vitrified Pipe Co., Mineral Wells, Tex.
Texsteam Corp., P. O. Drawer 9127, Houston 11, Tex.
Thermac Co., 800 E. 108th St., Los Angeles, Calif.
Thermador Electrical Mfg., 5119 S. District Blvd., Los Angeles 22, Calif.
Thermal Agency, 1515 Dallas Ave., Houston, Tex.
Thermo-Base Div., Gerwin Industries, 214 Spring St., Michigan City, Ind.
Thermo-Mat Co., 814 S. Robertson Blvd., Los Angeles 35, Calif.
Thermo-Products, Inc., North Judson, Ind.
ThermoRay Corp., South Buckhout St., Irvington-On-Hudson, N. Y.
Therm-O-Wheel, Inc., 1040 B-22 St., Far Rockaway 91, N. Y.
Thermoid Co., Trenton, N. J.
Thomas Co., Arthur H., W. Washington Square, Philadelphia, Pa.
Thomas Flexible Coupling, Main Ave. & Biddle St., Warren, Pa.
Thomas Industries, Inc., Electric Sprayit Div., 1415-25 Illinois Ave., Sheboygan, Wis.
Thompson and Co., 1085 Allegheny Ave., Oakmont, Pa.
Thompson & Son Co., The Henry G., 277 Chapel St., New Haven, Conn.
Thompson Research & Mfg. Co., Davenport, Fla.
Thomson Electric Welder Co., 161 Pleasant St., Lynn, Mass.
Thor Power Tool Co., 175 N. State St., Aurora, Ill.
Thor Tool & Die Co., 865 Estabrook, San Leandro, Calif.
Thread-Ezy Mfg. Co., Corunna, Mich.
Threadwell Tap & Die Co., Greenfield, Mass.
Three Point Industries, 3767 N. Racine Ave., Chicago 13, Ill.
Thrush & Co., H. A., Peru, Ind.
Thwing-Albert Instrument Co., Penn and Pulaski Ave., Philadelphia 44, Pa.
Tierney Rotor Ventilator Co., 239 Fourth Ave., S., Minneapolis, Minn.
Timken Roller Bearing Co., 1835 Dueber Ave., S. W., Canton 6, O.
Timken Silent Automatic Div., Rockwell Spring & Axle Co., Jackson, Mich.
Tinnerman Products, Inc., Dept. No. 16, P. O. Box 6688, Cleveland 1, O.
Tippett & Wood, Morris and Warren Sts., Phillipsburg, N. J.
Titchener & Co., E. H., 67 Clinton St., Binghamton, N. Y.
Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N. J.
Titus Mfg. Corp., Box 810, Hiway 20 West, Waterloo, Iowa
Titusville Iron Wks. Co., The, Titusville, Pa.
Tjernlund Mfg. Co., 2140 Kasota Ave., St. Paul 14, Minn.
Todd Shipyards Corp., Products Div., Columbia & Halleck Sts., Brooklyn, N. Y.
Toledo Pipe Threading Machine Co., 1445 Summit St., Toledo 4, O.
Torit Mfg. Co., 292 Walnut St., St. Paul 2, Minn.
Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
Torrington Co., The, Bantam Bearings Div., South Bend 21, Ind.
Torrington Mfg. Co., The, Torrington, Conn.
Torrington Mfg. Co., The, Western Div., 15001 Oxnard St., Van Nuys, Calif.
TOT Towers, Inc., P.O. Box 2564, 5220 Lawndale, Houston 1, Texas
Toungate & Coats, P. O. Box 241, Austin, Tex.

Trade-Wind Motorfans, Inc., 7755 Paramount Bldg., Rivera, Calif.
Trane Co., The, La Crosse, Wis.
Tranter Mfg. Inc., Lansing 4, Mich.
Trent, Inc., Leverington Ave. and Wilde St., Philadelphia 27, Pa.
Trent Tube Co., 430 Church St., East Troy, Wis.
Trerice Co., H. O., 1420 W. Lafayette Blvd., Detroit 16, Mich.
Triangle Conduit & Cable Co., Inc., Triangle & Jersey Aves., New Brunswick, N. J.
Triangle Mfg. Co., 396 Division St., Oshkosh, Wis.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., 50 Frank St., Worcester, Mass.
Trimount Instrument Co., 3119 W. Lake St., Chicago 12, Ill.
Trindl Products, Ltd., 1807-11 S. Clark St., Chicago 16, Ill.
Trion, Inc., 1000 Island Ave., McKees Rocks, Pa.
Tripar Products, Inc., 14641 West Eleven Mile Rd., Royal Oak, Mich.
Triplex Heating Specialty Co., Inc., 252 N. Grant, Peru, Ind.
Trombetta Solenoid Corp., 329 N. Milwaukee St., Milwaukee 2, Wis.
Tropical Paint Co., 1244-82 W. 70th St., Cleveland 2, O.
Troy Engine & Machine Co., 20 Railroad Ave., Troy, Pa.
Truflo Fan Co., 523 Main St., Harmony, Pa.
Trumbull Components Dept., General Electric Co., Woodford Ave., Plainville, Conn.
Truscon Laboratories, Caniff and Trunk R. R., Detroit 11, Mich.
Truscon Steel Div., Republic Steel Corp., 1315 Albert St., Youngstown 1, O.
Tryco Products, Inc., Railroad Sq., Westfield, Mass.
Tube Turns, A Div. of National Cylinder Gas Co., 224 E. Broadway, Louisville 1, Ky.
Tube Turns Plastics, Inc., 2929 Magazine St., Louisville 1, Ky.
Tubenfin Coil Co., 8035 Hartford, Houston, Tex.
Tubing Appliance Company, Inc., 10321 Anza Ave., Los Angeles, Calif.
Tubing Seal-Cap, Inc., 808 W. Santa Anita, San Gabriel, Cailf.
Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.
Turner Brass Wks., The, 821-47 Park Ave., Sycamore, Ill.
Tuthill Pump Co., 939 E. 95th St., Chicago 19, Ill.
Tuttle & Bailey, Inc., Corbin Ave., New Britain, Conn.
Tweco Products Co., P. O. Box 666, Wichita 1, Kan.
Twin Disc Clutch Co., 1310 Preston, Rockford, Ill.
Typhoon Air Conditioning Co., Div. of Hupp Corp., 505 Carroll St., Brooklyn 15, N. Y.

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[Also see "United States"]

U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54.
U. S. Electrical Tool Co., 3640 Llewellyn St., Cincinnati 23, O.
U. S. Expansion Bolt Co., P. O. Box 827, State St. & P.R.R., York, Pa.
U. S. Pipe & Mfg. Co., East Grand Ave., S. San Francisco, Calif.
U. S. Plug & Fitting Co., Wellington, O.
U. S. Thermo Control Co., 44 S. 12th St., Minneapolis, Minn.
Uehling Instrument Co., 473 Getty Ave., Paterson 3, N. J.
Ultrasonic Corp., 640 Memorial Dr., Cambridge 39, Mass.
Ultra-Viscoson Corp., The, 1240 Main St., Hartford 3, Conn.
Unexcelled Chemical Corp., Empire State Bldg., New York, N. Y.
Unifilter Co., 29845 W. 13 Mile Rd., Farmington, Mich.
Uniflow Mfg. Co., E. Lake Rd., Erie, Pa.
Unimax Switch Div., W. L. Maxson Corp., 460 W. 34th St., New York 1, N. Y.
Union Asbestos & Rubber Co., 332 S. Michigan Ave., Chicago 4, Ill.
Union Chill Mat Co., Grant Bldg., Pittsburgh, Pa.
Union Electric & Mfg. Co., 1057 Summit Ave., Jersey City, N. J.
Union Iron Wks., 1500 Cascade St., Erie, Pa.
Union Malleable Mfg. Co., P. O. Box 566, Ashland, O.
Union Metal Wks., 128 Carter St., Chelsea 50, Mass.
Union Pipe Fitting Co., Fort Atkinson, Wis.
Union Steam Pump Co., Capitol Ave., S. W., Battle Creek, Mich.
Union Water Meter Co., 333 Hermon St., Worcester, Mass.
Unistrut Products Co., 1013 W. Washington Blvd., Chicago 7, Ill.
United Chromium Div., Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y.
United Cooling Tower Co., P. O. Box 5959, 4022 Broadway, Kansas City 11, Mo.
United Cork Companies, Central Ave., Kearny, N. J.
United Electric Co., P. O. Box 119, Wichita Falls, Tex.
United Electric Controls Co., 85 School St., Watertown, Mass.
United Machinery Sales Co., 7709 S. Ashland Ave., Chicago 20, Ill.
United Metal Hose Co., Inc., 36-01 43rd Ave., Long Island City 1, N. Y.
United Specialty Corp., P.O. Box 698, El Dorado, Ark.

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United States Air Conditioning Corp., 33rd & Como Ave., S. E., Minneapolis 14, Minn.
United States Cooling Tower Co., Div. of Heatcraft Co., 414 W. Main St., Louisville, Ky.
United States Gasket Co., 602 N. 10th St., Camden, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
United States Gypsum Co., 300 W. Adams St., Chicago 6, Ill.
United States Mineral Wool Co., Stanhope, N. J.
United States Pipe & Foundry Co., Birmingham, Ala.
United States Register Co., Burnham St., Battle Creek, Mich.
United States Rubber Co., 1230 Ave. of the Americas, New York 20.
United States Steel Corp., 525 Wm. Penn Place Bldg., Pittsburgh 30.
United States Steel Supply Div., United States Steel Corp., 208 S. La Salle St., Chicago 4, Ill.
United States Stoneware Co., 60 E. 42nd St., New York 17, N. Y.
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United Wire & Supply Corp., 1497 Elmwood Ave., Cranston, R. I.
Universal Controls Corp., 731 W. Davis St., Dallas 8, Tex.
Universal Diffuser Corp., 1360 Garrison Ave., New York 59, N. Y.
Universal Electric Co., Owosso, Mich.
Universal Major Electric Appliances, Inc., P. O. Box 928, Baltimore, Md.
Universal Mfg. Co., 1440 San Pablo Ave., Berkeley 2, Calif.
Universal Products Mfg. Corp., Auburn, Ind.
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Universal Welder Corp., 2557 E. 79th St., Cleveland, O.
University Fan & Blower Co., 733 University Ave., Berkeley 10, Calif.
Uno Ventilator Co., 1236 Eastern Ave., Malden 48, Mass.
Up-Right Scaffolds, 1013 Pardee St., Berkeley 10, Calif.
Utah Hydro Corp., Ness Bldg., Salt Lake City, Utah
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Utica Radiator Corp., 2201 Dwyer Ave., Utica 2, N. Y.
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Utility Fan Corp., Div. of Utility Appliance Corp., 911 E. 59th St., Los Angeles 1, Calif.

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Valve Div. of ACF Industries, 1501 E. Ferry, Detroit, Mich.
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Vapor Heating Corp., 80 E. Jackson Blvd., Chicago 4, Ill.
Velan Engineering Co., 6585 Jeanne Mance St., Montreal, Canada.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.
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Warren Steam Pump Co., Inc., 300 Bridges Ave., Warren, Mass.
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Western Precipitation Corp., 1016 W. 9th St., Los Angeles, Calif.
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Western Wire Products Co., 1415-35 S. 18th St., St. Louis 4, Mo.
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Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass.
Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.
Westinghouse Electric Corp., Sturtevant Div., 136 Readville St., Hyde Park, Boston 36, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., 614 Frelinghuysen Ave., Newark, N. J.
Wheatland Tube Co., Bankers Securities Bldg., Juniper & Walnut Sts., Philadelphia 7, Pa.
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Wheeling Machine Products Co., Wheeling, W. Va.
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Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., 575 Madison Ave., New York 22, N. Y.
Wiedemann Machine Co., 4272 Wissahickon Ave., Philadelphia 32, Pa.
Wiegand Co., Edwin L., 7610 Thomas Blvd., Pittsburgh 8, Pa.
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Wilbur & Williams Co., 130 Lincoln St., Brighton 35, Mass.
Wilcolator Co., 1001 Newark Ave., Elizabeth 3, N. J.
Wilhelm Co., A., 3rd and Bern Sts., Reading, Pa.
Wilkinson Products Co., 3987 Chevy Chase Drive, Pasadena 3, Calif.
Will-Burt Co., The, Orrville, O.
Will Corp., 35 Russell St., Rochester 3, N. Y.
Williams & Co., J. H., Buffalo 7, N. Y.
Williams Chemical Co., 487 Broadway, New York 13, N. Y.
Williams Div., Eureka Williams Co., Div. of Henney Motor Co., Inc., 1201 East Bell, Bloomington, Ill.
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Williams & Son, I. B., Dover, N. H.
Williams Valve Co., D. T., Div. of The Schaible Co., 1086 Summer St., Cincinnati 4, O.
Williamson Co., 3500 Madison Rd., Cincinnati 9, O.
Willis Steel Corp., 156 N. Academy St., Galesburg, Ill.
Willson Products, Inc., 348 Thorn St., Reading, Pa.
Will-Weld Mfg. Co., Inc., 1523 Marcy St., Omaha 2, Nebr.
Wilmington Plastics Co., 810 S. Heald St., Wilmington, Del.
Wilson & Co., Inc., 4100 S. Ashland Ave., Chicago 9, Ill.
Wilson Co., H. A., The, U. S. Route 22, Union, N. J.
Wilson Co., K. R., General Offices & Factories, Arcade, N. Y.
Wilson Engineering Corp., 6 N. Michigan Ave., Chicago 2, Ill.
Wilson, Inc., Thomas C., 21-11 44th Ave., Long Island City, N. Y.
Windmaster Corp., 43 Vine St., Columbus 15, O.
Wind-Way Fan & Ventilator Co., 527 St. Joseph St., New Orleans 12.
Wing Mfg. Co., L. J., 140 Vreeland Mills Rd., Linden, N. J.
Winkler & Sons, Inc., A. E., 2337 N. 31st St., Milwaukee 10, Wis.
Winslow Engineering Co., 4069 Hollis, Oakland 8, Calif.
Wisconsin Oil Burner Co., 2720 Emil, Madison, Wis.
Wiss & Sons Co., J., 33 Littleton Ave., Newark 7, N. J.
Wiremold Co., Railroad & Elmwood, Hartford, Conn.
Witt Co., A. H., 940 N. Sycamore, Los Angeles, Calif.
Witte Engine Works, Oil Well Supply Div., United States Steel Corp., 1600 Oakland Ave., Kansas City 26, Mo.
Wittek Manufacturing Co., 4305 W. 24th Place, Chicago 23, Ill.
Wittenmeier Machinery Co., 850-860 N. Spaulding Ave., Chicago 51.
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Wolfe Co., Inc., The, Franklin C., 3644 Eastham Drive, Culver City, Calif.
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Worner Electronic Devices, Rankin, Ill.
Worthington Corp., Harrison & Worthington Sts., Harrison, N. J.
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Wysong & Miles Co., 625 Fulton St., Greensboro, N. C.

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Youngstown Welding & Engrg., 3714 Oakwood, Youngstown, O.
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Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.
Zimmerman Packing Co., 2768 Highland Ave., Cincinnati 12, O.
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Zink Co., John, 4401 S. Peoria, Tulsa 5, Okla.
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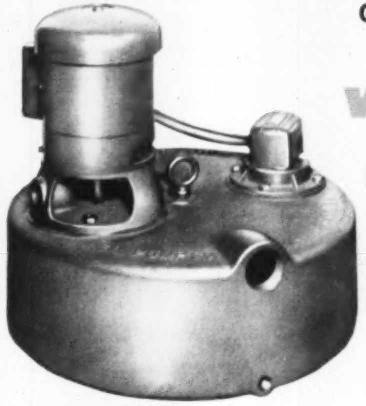
LOW PRESSURE SYSTEM *Condensate Pumps*

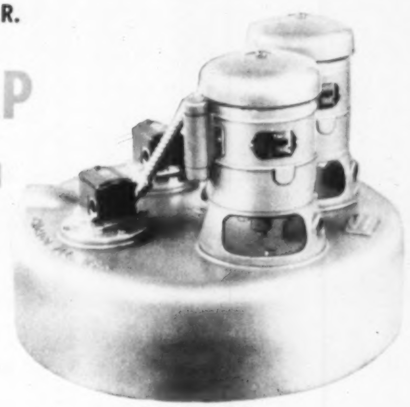
Capacities 500 to 10,000 sq. ft. E.D.R.

weil TVC PUMP

LOW RETURN CONNECTION
LOW SPEED, LONG LIFE
CAST IRON RECEIVER
LOW WATER
LINE



SINGLE UNIT
Fig. 302A
21" Diameter Receiver for
Single Units
Hgt. of Return above floor 6⅞"



DUPLEX UNIT
Fig. 303B
25½" Diameter Receiver for
Single or Duplex Units
Hgt. of Return above floor 7 1/16"

TVC SELECTION TABLE

Unit Number	Max. Sq. Ft. E.D.R.	Discharge Pressure At Pump	G.P.M. From Radiation	Cap. of Pump	H.P. of Motor	Return Inlet	Pump Discharge	Dia. of Receiver	Height of Unit
TVC 13	500	20 lbs.	.25	1.0 GPM	1/4	2"	1"	21"	21"
TVC 19	750	20 lbs.	.38	1.5 GPM	1/4	2"	1"	21"	21"
TVC 23	1000	20 lbs.	.5	1.5 GPM	1/4	2"	1"	21"	21"
TVC 29	2000	20 lbs.	1.0	3.0 GPM	1/4	2"	1"	21"	21"
TVC 35	4000	20 lbs.	2.0	6.0 GPM	1/4	2"	1"	21"	21"
TVC 41	6000	20 lbs.	3.0	9.0 GPM	1/2	2"	1"	21"	23½"
TVC 47	8000	20 lbs.	4.0	12.0 GPM	1/2	2"	1"	25½"	23½"
TVC 52	10000	20 lbs.	5.0	15.0 GPM	3/4	2"	1"	25½"	27½"

Intermediate Sizes Based Upon Discharge Pressure Required Are Available

See Bulletin TVC-300 for Full Specifications

OTHER WEIL CONDENSATE PUMPS

SRC Pumps (Bulletin SRC-450)
Pressures: 10 to 60 P.S.I.
Capacity: 1000 to 50,000 Sq. ft. EDR
Receiver: Steel
Features: Centrifugal pump, factory assembled, compact, conserving space; low return connection.

TR Pumps (Bulletin TR-100)
Pressures: 10 to 125 P.S.I.
Capacity: 1000 to 150,000 Sq. ft. EDR
Receiver: Steel or cast iron
Features: Designed for high and low pressure systems; with full automatic controls including automatic make-up can be furnished for boiler feed service.

NRG Pumps—Underground Type (Bulletin NRG-200)
Pressures: 10 to 60 P.S.I.
Capacity: 1000 to 150,000 Sq. ft. EDR
Receiver: Cast iron
Features: Receiver can be installed in ground (concrete pit not required) catching all below-the-floor returns while motor and controls are protected above ground.

WEIL SEWAGE EJECTORS AND SUMP PUMPS

SCREENLESS HEAVY DUTY SUBMERGED TYPE SEWAGE EJECTOR (Bulletin C-900)
Capacities: 50 to 1500 GPM

SUBMERSIBLE SEWAGE EJECTOR (Bulletin SE 860)
Discharges 3", 4", 5" and 6". Capacities to 2000 GPM

POWERHOUSE Cellar Drainer Sump Pump (Bulletin SI 540)
A bronze fitted sump pump with 1¼" discharge; for sumps to two feet.

ELECTRIC WATER BOY Sump Pump (Bulletin F-501)
1¼" and 1½" Discharge; settings to 8 ft.; capacities to 65 GPM

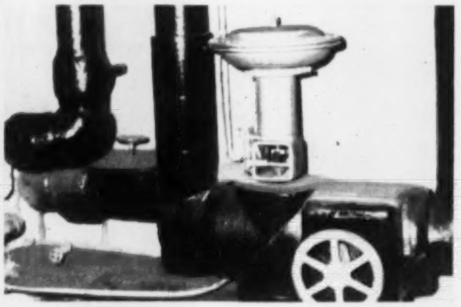
F2 — 2" DISCHARGE SUMP PUMP (Bulletin F-600)
A bronze fitted pump for sumps to 12 ft. and capacities to 100 GPM. A completely factory assembled unit.

B700 HEAVY DUTY Sump Pump (Bulletin B-700)
Discharges to 5"; capacities to 1500 GPM; single or duplex; handles HOT or COLD water.

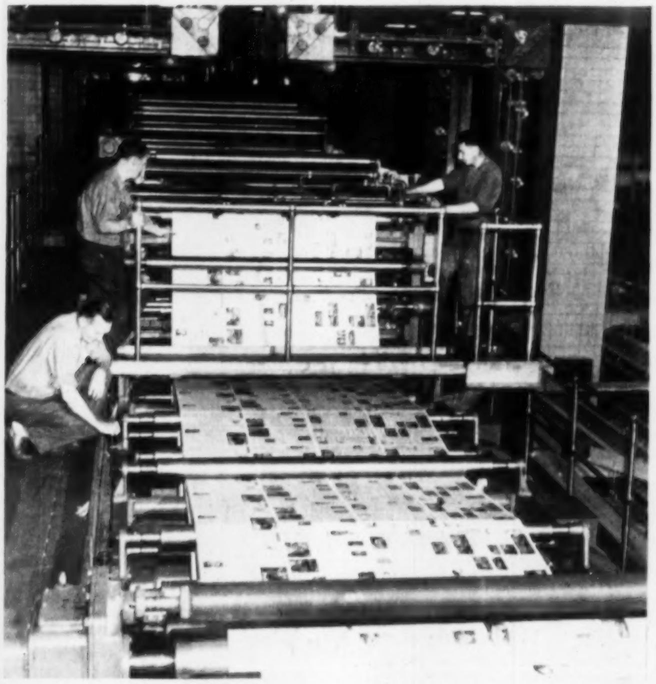
SUBMERSIBLE Cellar Drainer (Bulletin SS-800)
Designed to operate under water; bronze fitted, 1¼" discharge; operates in sumps to 20 ft. deep.

weil PUMP CO. • 1514-A N. Fremont St. • Chicago, Ill.

Rotogravure Building, Triangle Publications, Inc., Philadelphia. Albert Kahn Associated Architects & Engineers, architects and engineers, Detroit; Eggly-Furlow Engineers, mechanical engineers, Philadelphia.

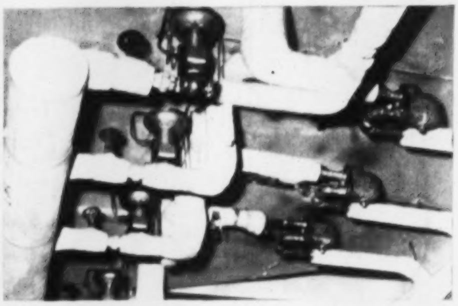


AIR CONDITIONING. A Johnson 3-Way Mixing Valve, with Pilot Positioner, gives precision control of chilled water supply to a unit serving a processing area.

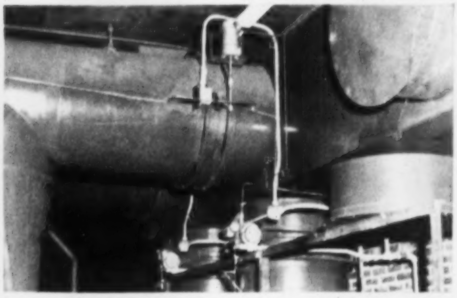


HEATING and VENTILATING. Strategically located Johnson Thermostats regulate heating and ventilating systems for huge press rooms housing 61 giant, high speed press units. Johnson Humidostats closely control relative humidity also.

INTRICATE CONTROL PROBLEMS CORRECTLY SOLVED by JOHNSON



REHEAT COILS are controlled by Johnson Steam Valves in response to demands from Room Thermostats. Pilot Positioners provide maximum, accurate repositioning power.



SOLVENT RECOVERY SYSTEM receives vapor-laden air at rate of 1500 cfm from each press unit. Johnson Static Pressure Regulators and Damper Operators help insure safe air movement through enormous duct system.

Triangle Publications' impressive Rotogravure Building is one of the largest and best equipped gravure plants in the world.

Dependable control of temperatures and humidities is essential in an operation this size. Processing requirements, product protection, worker comfort, safety and operating costs are among the complex factors which must be resolved correctly.

A Johnson-engineered Control System, in command of 25 central heating, ventilating and air conditioning systems, solves all of these problems with precision, satisfying the exact needs of such diversified spaces as press rooms, paper storage, etching and developing rooms, private and general offices and cafeteria.

In addition, other Johnson controllers are applied to the solvent recovery, waste paper pneumatic conveyor, paper handling, ink handling and exhaust systems.

How about your control problems? Whether they involve a simple application of one or a few controllers, or the installation of an intricate temperature, humidity or process control *system*, look to Johnson for the correct answer. An engineer from a nearby Johnson branch will gladly give you his recommendations without obligation. Johnson Service Company, Milwaukee 1, Wisconsin. Direct Branch Offices in Principal Cities.

JOHNSON CONTROL

TEMPERATURE · AIR CONDITIONING

PLANNING • MANUFACTURING • INSTALLING • SINCE 1885